Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOU NAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS.

VOLUME X.] NEW-YORK DECEMBER 30, 1854. [NUMBER 16.

THE
SCIENTIFIC AMERICAN,
PUBLISHED WEEKLY
At 128 Fulton Street, N. Y. (Sun Buildings.)
BY MUNN & COMPANY.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Agents.

H. Taylor, Baltimore, Md. — Dexter & Bro., New York.
Federhen & Co., Boston. — B. Dawson, Montreal, C. E.
Stokes & Bro., Philadelphia. — M. Boullemet, Mobile, Ala.
G. B. Mitchel, Savannah, Ga. — E. W. Wiley, New Orleans.
S. G. Courtenay, Charleston. — E. G. Fuller, Halifax, N. S.
D.M. Dewey, Rochester, N.Y. — S. W. Pease, Cincinnati, O.
Avery Bellford & Co., London — M. M. Gardissal & Co., Paris.

Responsible Agents may also be found in all the principal cities and towns in the United States.

TERMS—$2 a-year :—$1 in advance and the remainder in six months.

Iron Batteries.

The iron floating batteries which are being constructed in England, for battering the walls of Sevastopol and Cronstadt, it seems, are of American origin. About thirty years ago, Robert L. Stevens, of Hoboken, made some experiments, which proved conclusively that shot could be effectually arrested by a thickness of wrought iron proportioned to the diameter of the ball. Some time in the year 1840-'42, Mr. Stevens proposed to build a Floating Steam Battery of iron, as a protection, in the event of a war, to the harbor of New York. By order of the Government experiments were made to test the correctness of this theory, under the supervision of a Board of Navy and Army officers. The result proved four-and-a-half inches in thickness of wrought iron to be a perfect defence against a sixty-four pound solid shot, fired at ten yards distance from the target.

Upon their report of these facts, Congress directed the Secretary of the Navy to enter into a contract with Robert L. Stevens for building a Steam Battery upon his plan, for the defence of the harbor of New York. After the execution of this agreement, Mr. Stevens constructed a dry dock capable of containing a vessel of the size required by the contract, together with shops, steam engines, furnaces, tools, &c., necessary to the construction of such a vessel.

About two years ago, at the earnest solicitation of Com. Stockton, then a member of the U. S. Senate, Congress again directed the Secretary of the Navy to proceed with the vessel under the contract. This iron battery is now, with the exception of a few ribs, completely in frame, and about one-third planked up with heavy iron plates. From the difficulty of procuring funds during the severe pressure in the money market, he was reluctantly compelled, two weeks ago, to discharge, out of the four hundred and seventy men engaged in her construction, one hundred and forty of those working by the day in the yard at Hoboken.

The appropriation for this iron steam battery, whose sides are to be six or more inches in thickness, and whose length on the water line is now 400 feet, was two hundred and fifty thousand dollars.

Steam Valves.

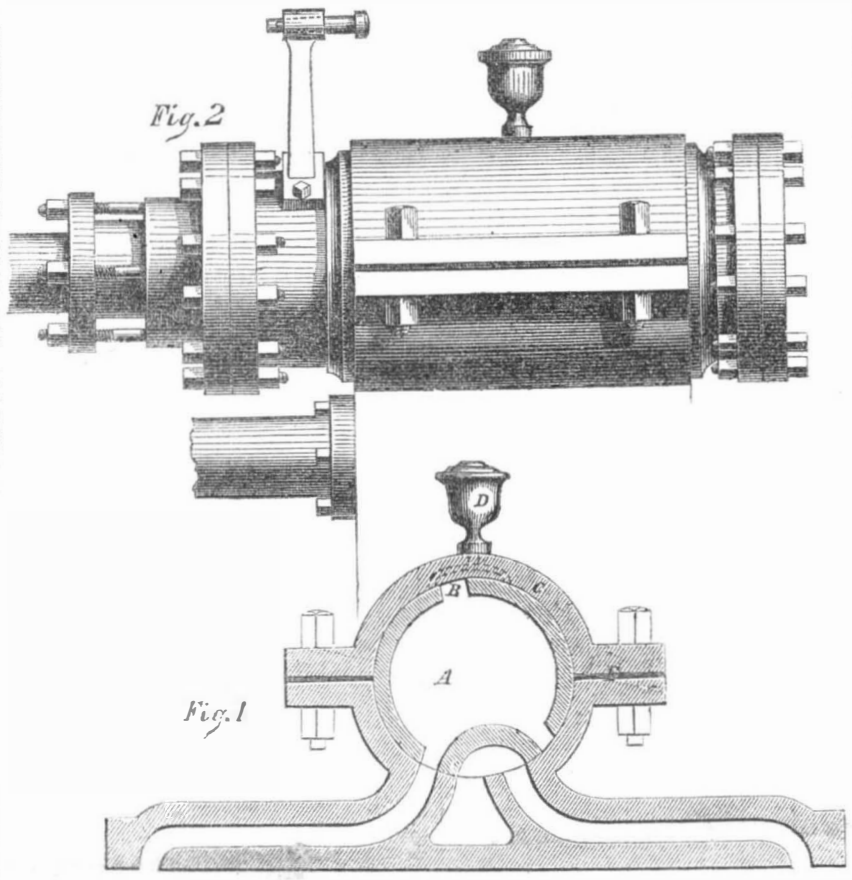
The annexed figures are views of a new valve for engines, invented by Homer Bloomfield, of Springville, Erie Co., N. Y., who has taken measures to secure a patent.

Figure 1 is a transverse vertical section of the valve, and the steam passages of the cylinder of an engine, and figure 2 is a side elevation of the valve, with the inlet pipe attached, and the crank pin for oscillating the valve.

As the construction of this valve is exceedingly simple, it will readily be understood by every mechanic, from a very brief description.

A represents the cylindrical valve, which forms a steam box, with head and bottom like a cylinder. This valve extends to the outside

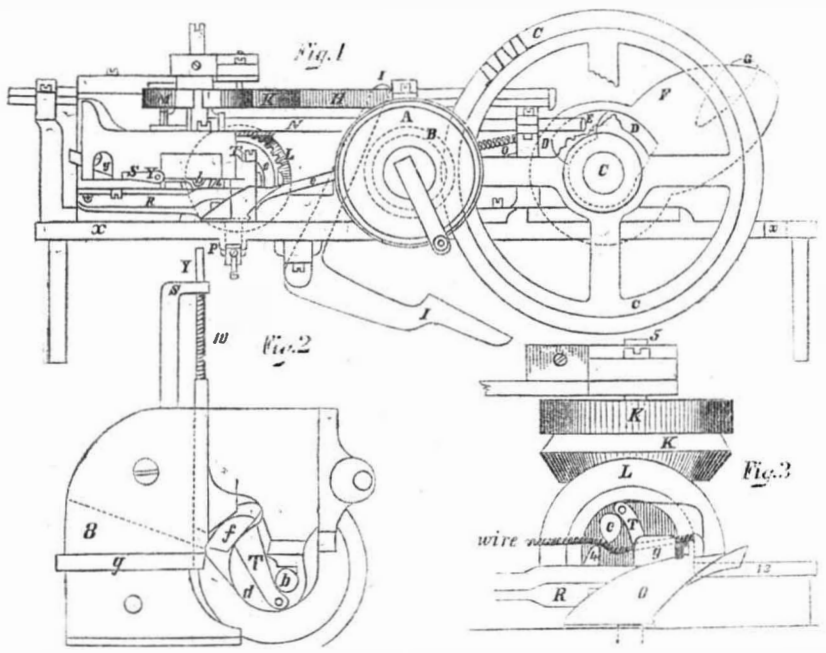
BLOO FIELD'S CYLINDRICAL STEAM VALVE.



of the valve cover, C, and is oscillated by the eccentric rod, which is attached to the pin of the arm shown in figure 1. B is an opening in the roof of the valve to counteract the abutting force of the steam on the cylinder face; D is an oil cup, and there are channels cut in the valve to allow its whole surface to be lubricated; E is a layer of vulcanized india rubber packing to render the cover, C, steam tight. In figure 1 the steam is exhausting from the steam cylinder at the right hand end, and the engine is taking in steam by the left hand port and passage. This figure is taken through the length of the steam cylinder, and is consequently at right angles to figure 2, which shows the exhaust pipe on the steam cylinder under the top inlet steam pipe. This explains the construction and *modus operandi* of this valve. The advantages claimed for it by its author are, 1st, Perfect freedom from unequal steam pressure. 2nd, Accessibility of all its parts to lubrication. 3rd, Simplicity. 4th, Even wear of surface after it is ground in steam tight.

More information respecting it may be obtained by letter addressed to Mr. Bloomfield, at Springville.

MACHINE FOR MAKING CHAIN LINKS.



The annexed engravings are views of an improved machine for making chain links, for which a patent was granted to Arcalous Wyckoff, on the 14th of last February.

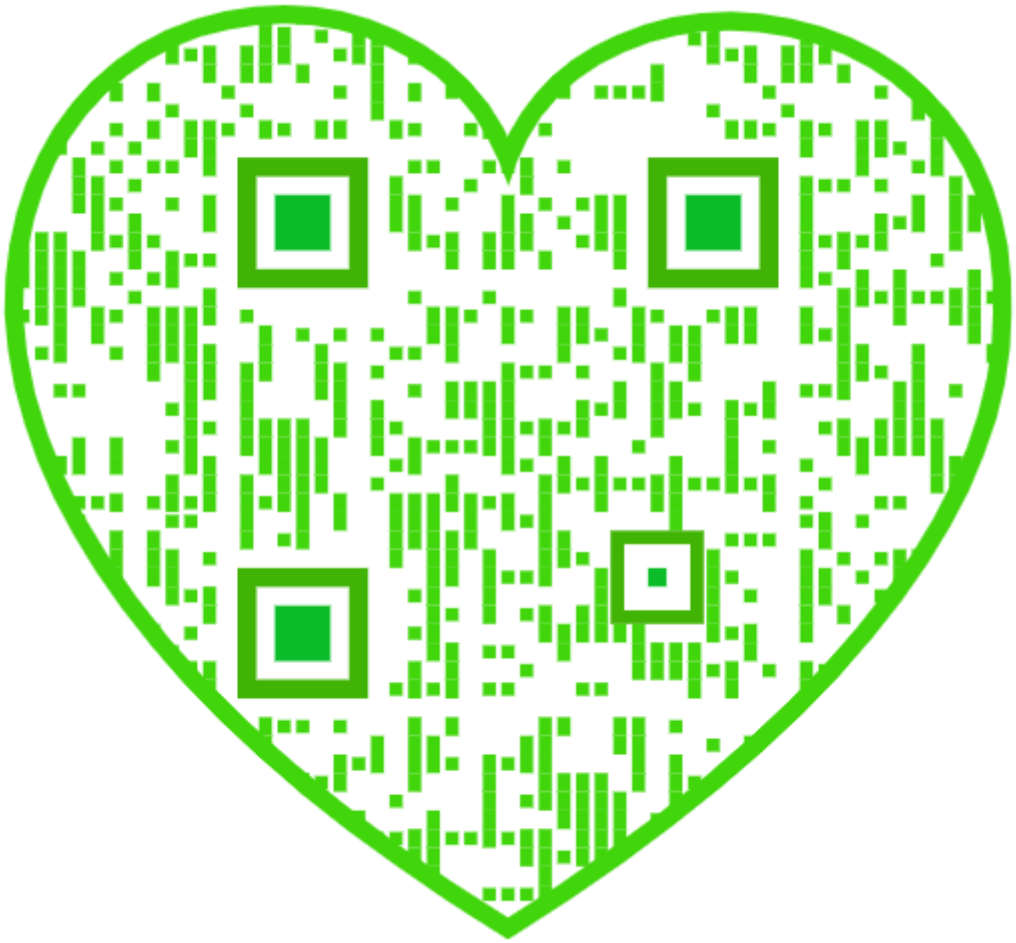
Figure 1 is a side elevation of the machine; figure 2 is a detached view, exhibiting on the under side, the cutter and bender of the wire in the horizontal movement thereof, and figure 3 is a detached view of a portion of figure 1, to show the action of the vertical bender, sleeve, and lever, giving the middle bend of the link. Similar letters refer to like parts on the three figures.

The nature of this improvement in machines for making chains consists in giving the grip and middle bend of the link, cutting the wire the requisite length, and bending both ends thereof simultaneously, and by an automatic movement, delivering the formed link ready for joining in a continuous chain.

In figure 1, *x x* represent a solid table. A is the pulley to which the power is applied, carrying on its shaft a pinion, B, giving motion to the driving wheel, C, on shaft, C; D and E are cams on the horizontal shaft, C, for operating the bars, O and N; F is a large cam also on the shaft, C, which striking against the end of the bar, carrying rack, H, gives an intermittent motion to the pinion, K, placed on a vertical shaft, which also carries a bevel pinion (placed under K for giving motion to L, carrying a sleeve,) on the outer end of which is a bending arm, which in its semi-revolution forms one eye of the link; M is a pinion (driven by K) which is placed on a vertical shaft, and also carrying a sleeve, on the end of which is secured the knife or die, *f*, for cutting the wire into suitable lengths, and likewise for bending the other eye of each link; O is a bar moved by cam E, it operates a lever, R, for giving the middle bend to the link, and holding or clamping the wire while being cut by *f*, and stationary die, *g*, also retaining it until the link is formed; N is a bar moved by cam, D, operating the pinion, M, by striking a stud while the wire is cutting; P is a gauge (operated on by a set screw,) for graduating the pressure of the angular end of the slide bar, O, on the lever, R, in giving the middle bend and grip to the link; Y is a sliding bar for closing the opening, 8, figure 2, through which the wire is fed; it is pressed by the back of the cutter, *f*, which contracts the helical spring, 10, on the shank of Y; this spring re-acts the moment the pressure is removed, and the bar, Y, is forced back and closes the opening, 8, while the eyes of the link are forming; T T are small flat springs having stub bolts or pins working in incline grooves in the ends of the sleeves or pinions, M and L; they are for the purpose of throwing off the link formed on the mandrels, *c* and *b*. The mandrel, *b*, is the one around which the end of the wire is carried horizontally by the die, *f*, in forming one eye; *c* is the mandrel around which the wire is carried vertically by the bender on the sleeve of L, simultaneously with the formation of the other eye on *b*; G is a cam secured on the side of cam F, and in its revolution operating on lever, I, draws back the rack, H, giving a reverse movement to all the pinions except B, the rod, Y, being moved by the back of the die, *f*, permits the wire to be fed in opening 8.

The operation is as follows:—A wire being introduced in opening 8, and held at a slight angle, is forced against the adjustable stop, 12, passing through a guide near to that side; the angular projection, 4, on lever R, is brought to bear diagonally on the wire, and forcing it up between the pins, *c* and *b*, by means of cam E, operating on bar O, and forcing the angular projection thereon under the lever, R, raises it, and thus gives the middle bend to the wire, and securely clamping it between the pins, and against the plates. The die, *f*, is now moved by the semi-revolution of pinion M, acted on by bar N, and cam D, and cuts off the wire rod the requisite length for a link, at the same time carrying it horizontally around the pin or mandril, *b*, while the bender on the sleeve of pinion, L, simultaneously carries the other end round the pin, *c*; L receiving its motion from the miter wheel under K, said wheel being actuated by the sliding rack, H, and cam, F, and completes the link. The springs, T T, are now forced outwards by the pins working in incline grooves on the ends of the sleeves, and thus

© 1854 SCIENTIFIC AMERICAN, INC



slide the eyes off the pins or mandrils, *c* and *b*, and the link drops from the machine ready for joining, which may be done by closing the eyes by hand, but much more perfectly by machinery.

This machine is now in operation at Columbus, Ohio; it makes about sixty links per minute, or fifteen hundred pounds per day, and bends them ready for use. At the time the patent was granted the patentee was residing in this State. He is now residing in Columbus, O., where more information can be obtained by letter addressed to Wyckoff & Co., dealers in chain pumps, &c.

The Art of Dyeing—No. 1.

Every nation—the most savage and civilized—have been acquainted with this art, in some measure, from the remotest ages of antiquity. Tyre was famous for coloring purple, and ancient India for cotton prints.—Among the modern nations, France, Germany, and Britain maintain a superior claim to an acquaintance with dyeing. The nature of this art consists in imparting to fabrics various colors, by the application of certain substances to them, in water baths. The art is a chemical one entirely; but little known to the professors of chemistry, as its secrets have been confined to the practical workman. It shall be our endeavor to reveal these in plain terms, so that all may understand them. We will conduct the subject in chapters relating to classes of colors, and will first commence with the primary colors, and will take 'yellow' or the luminous ray first.

YELLOW ON COTTON—All cotton yarn must be first boiled in clean water before it is dyed. It is first made up in bundles of ten pounds each, by tying a strong thread loosely round each hank, and strapping each bundle with two of its own hanks, to keep all from being entangled when boiling. In some large dye shops, there are boilers which will hold 2000 pounds, or 200 ten pound bundles. These bundles are boiled for about three hours, until all the air is expelled from the minute cells of the cotton. The water is then run off, and the bundles put on straight sticks, about one inch in diameter and two feet long—six sticks for each ten pounds. The yarn is wrung on arms, called pegs, and scutched out evenly by the workmen. It requires practice to do this, and could no more be taught by words than blacksmithing.

Yellow can be dyed with various substances; the most common on cotton at the present time, is produced by the bi-chromate of potash and the acetate or nitrate of lead. To dye ten pounds of cotton yarn a good yellow, dissolve three ounces of the bi-chromate of potash in a small clean dish, and nine ounces of the acetate of lead in another, and then place about ten common pailsfull of clean milk-warm water into each of two separate tubs, and into one pour the dissolved acetate of lead, and enter the yarn, giving each hank five turns, one after another, over the pins, and then wring and scutch them out. Pour now the dissolved bi-chromate of potash into the other clean tub of water, and give the leaded yarn five like turns in this, when it will assume a beautiful yellow color. After every dip the yarn is aired in a frame, and is lastly run through the tub of acetate of lead, washed, wrung or pressed, and is ready to be dried. Any depth of shade can be produced by giving a number of dips to the yarn, wringing and airing after each dip. It is always best to give two dips to every shade, in order to make the color level. If the yarn was not finished out of the lead solution, it would dry in reddish spots.

STRAW COLORS are produced on cotton yarn by first bleaching the yarn, washing it well, and treating it as for yellow, only giving less dye stuff. One ounce of the bi-chromate of potash will dye ten pounds of yarn this shade. Three ounces of the acetate of lead are required as a mordant for every ounce of the bi-chromate of potash that is used as a dye. The nitrate of lead is employed for deep shades of yellow; it gives the yarn a rich reddish tint; the acetate of lead produced a lemon tinted yellow. If some dissolved sulphate of zinc is employed (about one ounce to the ten pounds of yarn,) in a clean tub of water, after the last leading, and the cotton run through this, giving five turns, the color is rendered more permanent.

Scientific Memoranda.

THE ARTESIAN WELL IN CHARLESTON—Our friend Mr. Welton has not of late made much noise, perhaps from the very reason that he is in deep, but his operations are nevertheless very interesting. His bore is now 1217 feet deep, of which all but the last twelve feet is tubed. At this point there was encountered an upward force of sand that kept him for some time employed in holding his ground. Gradually he has cleared this out, and the flow of water has increased. On Wednesday night, the water, by its own force, brought up a barrel of sand—equal to a good day's work of his machines; and the amount of water coming up yesterday morning, was equal to three gallons a minute. This is a rapid increase since the sand stratum was reached, and we have no small hopes that in this very bed will be found what we have been looking for—a sufficient supply of good water.—[Charleston Mercury.

GUANO DISCOVERIES—The guano deposit which was recently discovered by an American shipmaster upon Bird Island, a short distance to the eastward of St. Thomas, towards Barbadoes, is said to be equal to at least three or four hundred thousand tuns, and in quality it approaches that of the Chincha Islands. The New York *Post* says, that another island has been discovered, with at least a million tuns on it, the locality of which is yet a secret. Measures are now taking for the organization of a company to bring the guano to market. The value of this article to the farmer makes these discoveries a matter of general importance.

LEAD—The annual amount of the lead produce of the United States is estimated at from 18,000 to 20,000 tuns, which is supplied by the States of Illinois, Wisconsin, Missouri, Arkansas, Virginia, Pennsylvania, and New York. Besides this, about 20,000 tuns are annually imported from foreign countries, of which England and Spain furnish by far the greater portion. Considerable is brought from France, but this is mostly mined in Spain.

AN AMERICAN VESSEL LOST IN THE BLACK SEA—Among the vessels lost in or near the Black Sea, during the destructive gale in which so many transports were wrecked, was the American propeller William Penn. This vessel sailed from New York last summer, for the Mediterranean, and was taken up at Marseilles by the French government to transport troops and stores. She was last heard from at Constantinople, and was probably lost in the Dardanelles, although we have received no particulars. The William Penn was formerly a packet running between Philadelphia and Boston.

HOW TO DO UP SHIRT BOSOMS—We often hear ladies expressing a wish to know by what process the gloss on new linens, shirt bosoms, etc., is produced, and in order to gratify them, we subjoin the following recipe:

"Take two ounces of fine white gum arabic powder—put it in a pitcher, and pour on a pint or more of boiling water, according to the degree of strength you desire—and then having covered it, let it stand all night—in the morning pour it carefully from the dregs into a clean bottle, cork it and keep it for use. A table spoonful of gum water stirred into a pint of starch made in the usual manner, will give to lawn, either white or printed, a look of newness, when nothing else can restore them after they have been washed.—[Exchange.

SMOKE FROM BOILER FURNACES—At a recent meeting of the London Institution for Civil Engineers, a paper was read on this subject, by Mr. W. Woodcock, in which it was stated that ordinary pit-coal, under the process of distillation, gave off various volatile substances, some of which were gases, such as "hydrogen,"—"marsh gas,"—"olefiant gas,"—"carbonic oxyd," &c., these and others existed in the furnace only in a gaseous state, becoming liquid or solid when in the external air, and of such coal-tar was composed; and amidst them the carbon, in minute subdivision, was held in suspension, giving to the smoke its sable hue. All these gases were combustible at given temperatures, provided a certain amount of oxygen was present. It was shown that the air containing this oxygen, if imputed to the gases, after leaving the fuel on the bars, must be administered so as not to reduce the temperature of their gases below "flame points." The simplest means of preventing the formation of smoke were shown to be providing for an ample supply of oxygen in a condensed state, in the form of cold air, to the fuel on the fire bars, and by administering such further supply of oxygen to the heated gases as might be necessary for their complete combustion whilst in contact with the boiler; this latter supply being given at such a temperature of hot-air as would insure successive ignition of the gases as they were evolved. Thus, by establishing nearly perfect primary combustion, the quantity of smoke evolved was shown to be reduced to a minimum, of which no visible trace ever reached the summit of the chimney.

DEATH BY LIGHTNING—The French Academy of Sciences have received some interesting observations on the effects of the lightning stroke upon human beings. The following facts are the result of patient observations made by M. Boudin, chief surgeon to the Hospital du Roule:—The number of people yearly struck by lightning in France averages 200. The region where the lightning had been the most fatal is the central plateau of France, comprising the departments of Cantal, Puy-de-Dome, and other departments which are mountainous or present elevated ground. Out of 101 people struck, 4 were struck in March, 6 in April, 8 in May, 22 in June, 13 in July, 19 in August, 14 in September, and 15 in October. One fourth of the people who have been struck may trace the misfortune to their own imprudence, in taking shelter under trees, which attract the electric fluid.

M. Boudin called attention to two curious facts in connection with this subject. The first was, that dead men struck by lightning had been found in exactly the upright position they held when killed; the second was, that other bodies bore upon them faint impressions of outward objects, probably somewhat resembling photographic shadows. Animals, however, are much more exposed to the influence of lightning than men, and suffer more by its destructive properties. More than once a single flash of lightning has destroyed an entire flock of sheep, and, according to M. D'Abbadie, flocks of 2,000 in Ethiopia.

VELOCITY OF RIVERS—Sir John Leslie has given a simple formula for finding the means or central velocity of a river or water-course, and he states that it is quite conformable to actual observation. Rule: Multiply the mean by hydraulic depth of a river by declivity, both in feet, and extract the square root of the product, the result diminished by 4-16th part, will be the mean velocity of the river in miles per hour. Thus, we ascertain the rate of the majestic roll of the sacred river of the Hindoos, which has only a fall of 4 inches per mile, and a mean by hydraulic depth of 30 feet, to be only about three miles an hour. The swelling tide of the mighty Amazon or Maranon, for the space of 600 miles before it discharges its flood into the deep, has a fall of only 10½ feet, which is about 1-5th of an inch per mile. For the space of 600 miles from the embouchure of this great river, the tides of the Atlantic silently oppose its lazy flow; but above this point the declivity is about 6 inches per mile, and the mean hydraulic depth about 70 fathoms; hence, the velocity of its water must be between 14 and 15 miles per hour, surpassing that of our Niagara. At this point, therefore, the opposition is dreadfully increased, and the conflict of the water is tremendous, the action of this enormous hydraulic ram of nature produces such a revulsion in the waters of the Maranon, that waves, rising to the hight of 180 feet, roll back upon the rapid stream with the noise of a cataract, overwhelming the banks of the Orellanic region. This phenomenon is justly called the bore, or by the Indians, pororaco, which must forever impede the useful navigation of the King of Rivers.—[Philadelphia Ledger.

[If this is so, then all the Encyclopedians are in error on the subject of navigating this splendid river. The *Encyclopedia Americana* says, that vessels of 500 tuns may sail from its mouth throughout almost its whole extent.

Spiking Guns.

In the accounts which come to us by every ocean steamer, of the siege of Sevastopol, we often noticed a statement made that "the guns were spiked." Our readers may like to know the modern method of spiking guns, practiced by the armies of the Crimea:

"The spikes are about four inches long, and of the dimensions of a tobacco pipe; the head flat; a barb at the point acts as a spring, which is naturally pressed to the shaft upon being forced into the touch-hole. Upon reaching the chamber of the gun it resumes its position, and it is impossible to withdraw it. It can only be got out by drilling—no easy task, as they are made of the hardest steel, and being also loose in the touch-hole, there is much difficulty in making a drill bite as effectually as it should do. Its application is the work of a moment, a single tap with the palm of the hand sufficing, This can be easily done, even if it be ever so dark."—[Exchange.

[The above we have seen in quite a number of our exchanges, and we are satisfied that it contains some great error. Hard steel is the worst kind of spike which can be used, a cold chisel and hammer will chip it through at a single blow. The best kind of spike is one made of soft tough iron; it can be driven in and made to fit the priming hole nearly as snugly as if it were welded therein.

Temperance on Railways.

The Superintendent of the New York and Erie Railroad—D. C. McCallum—has adopted a policy respecting the sale of ardent spirits, in all the depots along the line, which will meet the commendation of all good and sensible men. This is no less than a prohibition to sell intoxicating liquors in any shape. We hope other railroads will follow this excellent example.

Salt in Illinois.

The Mount Carmel *Register* states that the company engaged in searching for strong salt water at the old Saline Works, has lately struck a vein so strong that it will bear an egg. The company purpose having works in operation by the first of January.

A patent for making boots and shoes by machinery has been taken out in England, and a company formed for the erection of extensive works, capable of turning out 17,000 pairs of boots and shoes per day. If this be so, alas for Lynn.—[Boston Journal.

[Not so, worthy friend, for Lynn will just try to make twice as many, and will succeed too.

Gas in Nantucket.

Nantucket, the birth place of the American whale fishery, is now illuminated with coal gas. What will the whalers say to this.

Philadelphia Gas Works.

The new gas works of Philadelphia are said to be the most complete in the world.—The coals used for making the gas are received from the Virginia and Pittsburg mines, and cost $7 per tun.

Steam Fire Engines.

The New Orleans *Picayune* states that a steam fire engine is about to be built in that city, by M. Bolvin, a French engineer, by orders of the Common Council. The cost is to be $9000; the power fifty horse.

An Unprofitable River.

The Wellsburg *Herald* expresses the opinion that the Ohio River, above Wheeling, is an unprofitable one for steamboat men. One half of the year it is dried up, and the other half frozen up.

© 1854 SCIENTIFIC AMERICAN, INC

(For the Scientific American.)

Visibility of the Planet Venus in the Day time.

It is well known that the planet Venus may be seen with the naked eye even while the sun is on the meridian, when at or near her greatest brilliancy, which occurs about 36 days both before and after her inferior conjunction. Having perceived her with the unaided eye in brilliant sunshine, 90 days past her western elongation, on the 29th of December, 1852, and again, 105 days after her superior conjunction, on the 26th of August, 1853, I resolved to ascertain how near her two following conjunctions she could be observed in the day time without telescopic instruments.

She was seen a number of times, and at different hours of the day, between the last date given above and her inferior conjunction, which took place on the 28th of February, 1854. On the 4th of February, 24 days before her conjunction, at 4 h. P. M.. she appeared almost of the 3rd magnitude, which she fully reached before sunset. February 10th, 11 h. 50 m. A. M., saw the planet which appeared of above the 5th magnitude. Thin clouds were moving rapidly along the sky, sometimes passing over the planet, through which she could for the most part be distinctly seen, the sun shown brilliantly. In order to perceive her readily I found it necessary to stand so that some opaque object would hide the sun from view. At 0 h., 5 m. P. M., observed her again. The sky was then very clear in the vicinity of the sun and planet. Could barely perceive her with the sun shining full in my face. February 16th, 4 h. P. M., saw the planet, appearing of a little above the 5th magnitude. On the 17th I saw her at 15 minutes past 4 in the afternoon. She appeared no brighter than of the 5th magnitude. On the 21st I recognized her without difficulty a few minutes before sunset. This was only a week before her conjunction. Stormy weather prevented further observations until the 12th of March.

March 12th, 7 h., 15 m., A. M., saw the planet Venus with the naked eye, in very brilliant sunshine. At 9 h. 55 m., do., observed her again, she appearing of the 5th magnitude. At 12 h.—noon—she appeared like a pearly speck of the 5th magnitude. The light of the sun being intensely brilliant, was reflected from the snow-clad ground with a dazzling luster. This was only 12 days after her conjunction; eighteen days previous to conjunction she was seen near noonday.

The superior conjunction of Venus will take place on the 13th inst. From the 22nd of August to the 27th of October last, I observed her with the naked eye no less than 25 times in sunshine, frequently when the solar orb was on the meridian. On the 23rd of August, at noon, she appeared of the 5th magnitude; and throughout September, when similarly situated, she was apparently of between the 5th and 6th magnitudes. At noon on the 10th of October she was observed to be of above the 6th magnitude. She was seen at noonday on four consecutive days, ending with the 26th of the month, appearing of the 6th magnitude. October 27th 30 m.. P. M., saw the planet with the naked eye. She appeared of the 6th magnitude, and could be easily found. The sun was shining brilliantly in a cloudless sky. This was 47 days before her superior, and 241 days after her inferior conjunction. Owing to the cloudy and stormy state of the atmosphere, I was unable to make further observations until the 21st of November, when she could not be detected in a clear sky. Her north heliocentric latitude would favor her observation, both about her inferior conjunction and at the time of her last detection; but had the weather been favorable I think she could have been seen a number of days nearer her conjunctions, particularly the superior. Hence I conclude that on an average the planet Venus may be seen by the naked eye, at any hour during a clear day, providing that she has a sufficient altitude, for the space of about 232 days, while she is on the same side of the sun, or between her conjunctions. It may be truly said that such observations as the foregoing are of little practical value, but as everything pertaining to science, however trifling, should be known, I deem it proper to make them public. STILLMAN MASTERMAN.

Weld, Me., Dec. 9th, 1854.

[The above did not reach us in time for publication previous to the superior conjunction of Venus on the 13th inst.

(For the Scientific American.)

New York Crystal Palace—Experience of an Exhibitor.

You are well aware that in Anno Domini 1853, a Great World's Exhibition of all Nations was to come off in New York. Well, with no intention to speculate, but to let the world know we could beat the world in cherry lumber, I thought I should give it a turn, and on application to D. Leech's Transportation Co., was told he would put me two planks of 37 inches wide into New York free of charge. A short time afterwards the agent received a bill of $10 of charges for drawing the said plank to the Crystal Palace; this I paid without any further ifs or ands about it, feeling satisfied that our country was represented in the Palace, and that I was entitled to a season ticket. In the month of November, in that memorable year, I landed in New York, and as all great men do, I marched up Broadway until I got a view of a 'buss flourishing the sign "To the Crystal Palace." This I mounted, and after getting the worth of my sixpence, landed at the *Wonderful* Building in Reservoir Square. After making an observation of the outside, I concluded the grounds might do for a lumber yard in New York, and then I marched up to get a sight of the interior. The doorkeeper was very civil in asking for my fifty cents, but I declared I was an exhibitor and did'nt intend to pay a cent. He then requested me to go to another door for exhibitors, for further information, and considering this a distinguished token of consideration for such characters as myself, I walked forth with as much pomp as the Emperor Nicholas. At the other door I found a chap standing up in full uniform for the occasion, and thinking this was out of a peculiar feeling of respect for such big fish as myself entering there, I briskly walked forward until my career was arrested by a demand for my ticket. "Exhibitor," says I, "Exhibitor," says he, "where's your ticket then?" "Haint got one," says I, "but I want one, as I'm an Exhibitor." "What do you exhibit?" says he. "Cherry lumber," says I, "and something to brag of, too, I can tell ye." He then looked into a book, and questioned me as sharply as if I had robbed Wall street and carried the key in my pocket, then curtly declared I had'nt anything in the Glass House. "Stop there," says I, here are fifty cents, let me in, and if I show you the growth of our country for 300 years, you will just be pleased to refund, won't you. "No giving back," says he, "after we get the cash." He told the truth there. After making a search for some time with my new acquaintance, I found my plank under the stair-case, with my name in full, but put on exhibition by J. Mc———, the same individual that charged me ten dollars for drawing them up, and who had got a season ticket into the bargain. After conjecturing who J. Mc——— could be, I concluded he could not be a Know Nothing, he not being of the right family, but being determined to hunt him up, I found him at last, after a considerable waste of boot heels, away down near the foot of the city. "Hallo," says I, "how are ye, I want my ticket for the Exhibition." "Who are you?" says he. "The cherry plank man," said I, "who paid you the *moderate* sum of only ten dollars for drawing up his two planks to the Crystal Palace." Well I didn't think there was such a dull sharper in New York as Mac tried to be. All he knew was only to get as much as he could for drawing the two plank to the World's Fair—only ten dollars and a season ticket—and if I should not happen to come to New York, he might have the modest privilege of selling the plank, at a charge of ten dollars more for his trouble; conscientious man. After a good deal of talk on my part, and about as much innocent ignorance on his, he concluded to transfer the season ticket to me, but as this would take some days longer than I could stay in N. Y., his second thought was to send it to me. I, however, never received the ticket nor lumber from him; but last summer was invited by the President of the Crystal Palace Association to attend and receive a premium, as I had been awarded a Diploma. This I politely refused to do, and requested my premium to be sent by mail, which was done at a cost of twenty-five cents to me. This is the way my case stands at present. Like St. Pierre at the siege of Calais, I can exclaim, "Oh! my country, what I have suffered for you," and I have no doubt but there are a number "more left of the same sort." R. L.

Hollidaysburgh, Pa., Dec. 14th, 1854.

Pendulums and Balloons.

MESSRS. EDITORS—What became of the pendulum experiment? I never saw the result of what was accomplished at Bunker Hill monument. I expected to see the close of it in the SCIENTIFIC AMERICAN, but I looked in vain. It seemed to me to work very much like the spirit rappings. When you are looking with breathless anxiety to see the result, some mischievous spirit steps in and spoils it all.

Don't be too hard upon flying-machine makers. I don't think it is all a humbug; it will come after a time, but it may be long after our day. A bird flies by mechanical power properly applied, and whenever any other machine can be made where the mechanical powers can be equally well applied, it will fly too. It will also carry as much weight in proportion to its power as a bird can. Look at the ease that a bird navigates the air, and can't a man do it as easy if he has as good machinery? WM. WRIGHT.

York Springs, Pa., Dec. 15th, 1854.

[We do not know of any discovery so desirable as one to navigate the atmosphere with safety, ease, and economy. We are not opposed to balloonists nor their experiments, but we must of necessity point out the scientific errors of those who make a grand flourish about navigating the air and performing wonderful things by old means newly vamped up.

Hardening Steel.

MESSRS. EDITORS—Allow me to notice an article in your paper of December 9th, over the signature of "C. G," in reference to the "hardening of steel."

"C. G." says, "If the carbon contained in the steel be crystallized, the steel is rendered hard, and if its carbon is in solution or uncrystallized, it becomes soft. Hence the reason, &c., &c."

He quite omits telling us how the sudden cooling of the compound of iron and carbon should cause the separation and crystallization of the latter element, or why the longer time occupied in said cooling should prevent the crystallization. I have been led to believe that *time* was a necessary element in the process of crystallization. In fact that the rationale of these phenomena is exactly the reverse of the explanation here given. The solution of carbon in iron (called steel) is *essentially hard* when cold. But although this carbon is readily dissolved and held in solution by iron (as well as some other metals) at a high temperature; the solvent power of the iron, like that of most other menstrua, is much diminished as this temperature is lowered. So that it is only under peculiar circumstances that the carbon can be retained in solution. When it is precipitated, the steel is in a measure reduced to iron—it is soft. When still in combination it forms steel—hard. This action may be much more readily traced in cast iron, especially when the carbon held in solution is in comparatively large quantity; its solvent power being increasd by the presence of foreign substances, I presume. When this iron comes from the foundry it is a light gray homogeneous mass, so hard as to be scarcely touched by the file. After being well annealed, it is much darker in color, from the deposition of carbon (not in crystals, but as charcoal) which may in some cases be distinguished by the microscope. It is now comparatively soft, and is readily filed or cut. I was neither aware of the presence of carbon in glass—nor of the fact that spirits of turpentine could dissolve it, according to "C. G." M. C. P.

Owings Mills, Md.

[The correspondent to which M. C. P. refers, did not say that turpentine could dissolve carbon. He was mistaken probably, in supposing there was carbon in glass,—because the carbonate of soda is used in its manufacture. This was natural, as the clear sparkling diamond is simply a piece of carbon. We have often been told that the use of turpentine enabled persons to drill holes in glass with great facility, and a correspondent, F. Sims, writing to us this week from Galveston, tells us that a skillful silversmith in that place told him "he could drill holes in glass with a common steel drill, by covering the surface with turpentine, in which some gum camphor has been rubbed up." It is perhaps unnecessary to add that our views agree with those of our present correspondent in relation to the crystalization of steel. Cast iron appears to be a sub-carburet of iron, but contains, beside some silicous, manganese, and phosphorus. In its conversion into bar iron the carbon is oxydized, and this is facilitated by the addition of the oxyd of iron in the puddling furnace; and for the same purpose the peroxyd of manganese is sometimes used. Cast iron is sometimes de-carbonized by embedding it in powdered hematite and heating it to redness, when the carbon is abstracted from the cast iron, and the latter rendered malleable. When pure wrought iron is embedded in charcoal powder and retained for some hours in contact with it, at a high temperature, it absorbs from 1-90th to 1-120th its weight of the carbon, which appears to penetrate through the metal, and it then becomes steel, which possesses the valuable property of what is termed *tempering*, that is of being brought to any degree of elasticity and hardness, by heating and cooling. This quality of temper in steel is no doubt due to crystallization—the arrangement and size of the molecules of the metal—as discussed in the above communication.

Improved Tuyere.

A tuyere is an apparatus placed at the point of the blast tube to admit air into smelting furnaces, to regulate the blast. As this is a very important matter in the smelting of metals, various improvements have been made in tuyeres to effect the objects desired in the most perfect manner. These seem not to have attained to perfection yet, Levi Kellogg, of Scottsburgh, N. Y., having made application for a patent for another improvement, which consists in having a taper opening made through a cylinder (which works within a box) set opposite the tube which receives the nozzle of the bellows. By turning this cylinder, either the large or small opening for admitting air through the cylinder is brought opposite to the fire, and thus the blast is either increased or diminished in breadth, according to the amount of heat required. This tuyere is suitable to forges as well as blast furnaces.

Lead Mine in the Heart of a Town.

A short time since, in digging a vault for the Bradley House, at Galena, Ill., the workmen came upon a show of mineral, that upon further working promises to be a valuable lode. The vein tends north and south, running from the point where it was opened across Beach street, beneath the new Baptist Church, and into the hill near the junction of Main and Frankfort streets. Permission has been obtained to tunnel Beach street; and with the trustees of the church, and the owners of the ground in the rear, a bargain has been made, and the work will begin at once.

Tripoli.

There is an immense cave situated some four miles from the Coosa River, and about six or ten miles from the town of Talladega, Ala., in which an inexhaustible amount of Tripoli is found, and of a quality pronounced to be superior to any found in the world.

© 1854 SCIENTIFIC AMERICAN, INC

New Inventions.

Truss for the Radical Cure of Rupture.

A truss which could be relied upon for the radical cure of hernia, or rupture, has long been a desideratum to the surgical profession, and the science and ingenuity of the most skillful surgical mechanicans of this country and of Europe, has been, until recently exercised in vain to construct a pad of proper form. S. N. Marsh, of No. 24 Maiden Lane, N. Y. City, has recently obtained a patent for a truss, in which two pads, instead of the usual single one, are employed, one in the form of a ring surrounding the other, which is in the form of a ball; the ring being for the purpose of closing the external and internal abdominal rings, while the ball produces pressure upon the inguinal canal to create adhesive inflammation for the purpose of effecting adhesion and closure; the pressure of the latter pad is graduated by a screw. By this truss the most obstinate rupture can be reduced in a few days, and a radical cure be effected in a time varying with the nature of the case. It has met with the most unqualified approbation of some of the most eminent surgeons of this and other cities, and we are enabled to recommend it, from a personal knowledge of a case of long standing, which was perfectly and speedily cured by it, without pain or inconvenience to the patient.

Double-acting Force Pump.

An improvement in double-acting force pumps has been made by W. C. and J. S. Burnham, of this city, who have taken measures to secure a patent. The pump is made of a single cylinder, covered at both ends, and made to discharge at both the up and down stroke, by a connected passage from the suction, thereby maintaining as constant a stream as a force pump of two cylinders and pistons. This pump is so arranged that nearly all its parts are cast at one operation, thereby reducing the expense of construction to about one-third of that of the common kind for house use. The valves are arranged to be easily accessible (something much required) for repairs, and an air chamber is placed both upon the suction and discharge pipes, by which the flow of water is maintained with great uniformity.

Self-Acting Fire Damper for Chimneys.

Among the many plans proposed for extinguishing fires in a chimney, H. S. Fisher, of Newburg, Pa., has invented a method of accomplishing this object by means of a self-acting fire damper. The damper, which is a plate of iron, is hung upon a horizontal rod in the chimney, and is kept edgeways in position by a chain, which is sufficiently long to allow the damper to close, but is made short enough to keep it in position by a combustible string, or fusible strip of metal, which, when the chimney takes fire, is burned or melted suddenly, and permits the damper to close and stop the passage of air from below, thus extinguishing the flames in a minute. This damper can be applied to flues ar well as chimneys, but as soot seldom accumulates in flues, there is little danger of them taking fire.

Sausage Stuffers.

Warren L. Battle, of Pond Town, Georgia, has taken measures to secure a patent for an improved sausage stuffer, which consists in having a cone placed within a corresponding shaped shell, and having the periphery of said cone as well as the inner surface of said shell formed with spiral ledges, which reduce the meat to a finely subdivided state, as the cone is turned and forced the meat at the same time into the membrane tube, which is attached to the shell, and thus cut the meat finely, and stuff the sausage at one continuous operation.

Tip-Top Blacking.

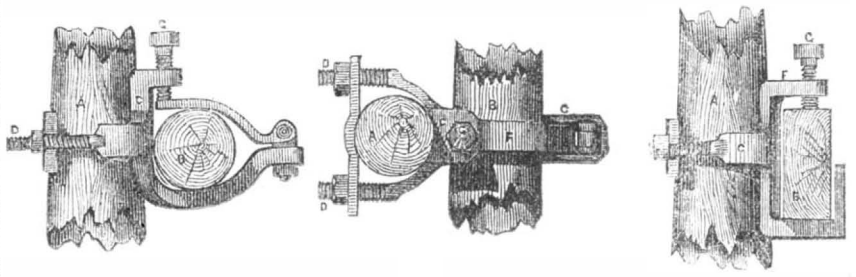
Edmund Palmer, No. 281 Seventh street, this city, sent us, a short time ago, four boxes of his oil paste blacking, with the injunction to give it a fair trial, and if it proved not to be the best we had ever used, to condemn it at once, but if it proved to be the best, we might use our pleasure in saying so. We have tried his blacking, and must pronounce a favorable verdict. It is really the best we have ever used. It polishes over oiled or greased boots, and shines with a brilliant lustre. Our readers know that if we had found this blacking to be no better than the common kind, we would have said so, although Mr. Palmer had sent us ten thousand boxes.

Felting Hat Bodies.

An improved machine for felting hat bodies has been invented by A. W. Patch and E. A. Parsons, of Newtown, Conn., which consists of a corrugated cylinder and an elastic concave; the hat bodies are forced around between this cylinder and the concave, and receive a motion like that of rubbing between the hands by the act of washing, whereby hat bodies are felted in a rapid and improved manner. A patent. has been applied for.

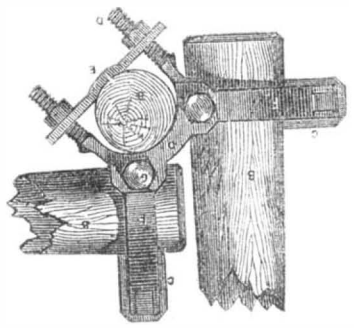
DIXON'S PATENT SCAFFOLD BRACKETS.

Fig. 1. Fig. 2. Fig. 3.



This improvement is designed to afford security against accidents from the falling of scaffolding used in the erection of all kinds of buildings. In aiming at so desirable an object, Mr. Dixon proposes to entirely do away with cordage for binding together the component uprights and ledges of scaffolding, and he substitutes a neat iron bracket, which answers the purpose much more efficienly. Fig. 1 of our engravings is a side elevation of a scaffold standard, with a ledger or cross pole connected to it by means of

Fig. 4.

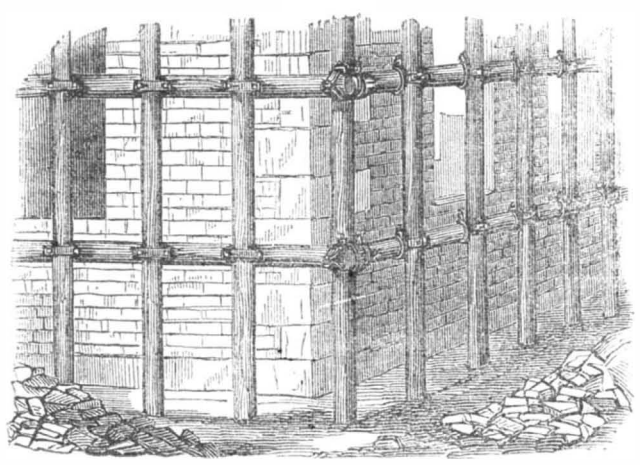


the improved bracket, and figure 2 is a plan corresponding. Fig. 4 is a plan of the form of bracket employed for corner standard poles. Fig. 3 is a side elevation of a modification of bracket, as adapted for ledgers of rectangular section, such as planks; and fig. 5 is a perspective view of a portion of scaffolding erected according to this system.

The bracket represented in figs. 1 and 2 is constructed for the intermediate standard poles of a piece of scaffolding. The standard or upright pole is at A, and the horizontal ledger or cross pole, B, is supported in the bracket, C. This bracket is in this instance made of wrought-iron, and is fixed upon the standard pole, A, by means of two arms with screwed ends, D, and a clamping plate, E, secured and tightened up against the back of the pole by nuts passed upon the screwed arms, D. The screwed ends, D, of the arms pass through slots in the clamping plate, E, one of the slots being cut through the end of the plate, to enable the plate to be shifted so as to pass the bracket upon the pole. The ledger or cross pole, B, is supported upon a curved arm formed upon the bracket, C, for the purpose, and it is held in position by a strap, F, connected to the bracket by a common and swivel joint. The strap, F, is tightened down upon the ledger, B, by means of a screw bolt, G, working in a projection on the upper part of the bracket, C. The bracket-piece represented in figs. 4 and 5, differs from that just deseribed. in being formed with two curved arms, with their straps, F, and screws, G, for supporting the ledgers or cross poles, B. These supporting arms are placed at right angles to each other, and serve to support those ledgers or cross poles which meet at the corners of pieces of scaffolding, and which are at right angles to each other.

The bracket represented in figure 4 differs very slightly from that shown in figures 1 and 2. The portion of the bracket, C, which supports the ledger, B, is shaped to correspond to it, and the swivel-piece, F, is dispensed with. the ledger being held in its

Figure 5.



place by the direct pinching action upon it of the screw, G. The bracket may be modified in form in various ways, and may be arranged so as to be fixed or tightened up upon the scaffold poles by means of wedges instead of screws, and it may either be made entirely of wrought-iron, which is preferred, or it may be made partly of wrought, and partly of cast iron. And in some cases the bracket may be made with complete sockets or rings, to be passed over the ends of the poles, and fixed by pinching screws or wedges.—[London Prac. Mech. Journal.

Cleaning the Flues of Stoves.

Cleveland M. Costley, of Whitesville, N. Y., has taken measures to secure a patent for an improved implement for cleaning the flues of circular elevated ovens of cooking stoves, which consists in having a flat cast-iron ring with a section cut out, said ring being provided with rods and fitting within the inner and outer casing of the oven. by which the flues of the oven can be cleaned out with great facility. This is an invention which has long been wanted for such stoves, a great objection to their use being the difficulty of keeping the flues clean.

Shoal Alarm for Ships.

John Devlin, of the city of Philadelphia, has taken measures to secure a patent for a shoal alarm for ships, which consists in attaching to the bow of a vessel a vertical jointed lever, projecting below the keel, at one end, and having connected to some other part of it an alarm bell, which will be operated by the lower end of the lever when the ship approaches a shoal, before the keel strikes, and thus give instant warning of danger. There is also connected to this lever a dial plate on the deck, which serves as an index to tell the exact depth of water. This alarm lever can also be formed at the foot like a buffer. so as to resist a shock upon a shoal, and thus allow of sufficient time by rapid seamanship to wear ship and get off.

Driving Reciprocating Saws.

An improvement in driving reciprocating saws has been made by G. P. Ketcham, of Bedford, Ind., which consists in giving a vibratory motion to a lever by means of an inclined wheel or cam, to supersede the common crank, the object being to obtain a more equitable and easy motion. Measures have been taken to secure a patent.

Globular Journals for Cars.

John Gill, of Patriot, Ind., in a letter to us, suggests making the journals of railroad car axles of a globular form, for saving oil. He says, "I find that a globular journal about mill machinery retains oil much better, and wears superior in every manner to a straight one, and this is especially the case with the crank wrists of engines."

Mortising Chisel.

Clarendon Williams, of Jackson, Tenn., has taken measures to secure a patent for an improved mortising tool, which consists in the peculiar arrangement of an augur, and a rectangular or four-sided chisel. whereby, as the augur progresses into the wood, the chisel does so also, thus forming a mortise at one operation by one motion.

Ox Yokes.

Measures have been taken to secure a patent by N. P. Quimby, of Potsdam, N. Y., for an improvement in ox yokes, whereby the bow stocks are permitted to yield on the necks of the oxen when drawing, and also allowed to be adjusted the required distance apart.

Sash Fastening.

Among the many plans for window fasteners, another has been added to the list by Jonathan Thomas, of Upper Dublin, Pa., which consists in the peculiar construction of the fastening, whereby the sash is sustained at any desired hight by the pressure of a roller against the side of the window casing, the pressure of the roller being graduated by means of a cam acting against a spring that presses against a box in which the roller is secured.

Car Ventilator.

E. E. Marvin, of Cayuga, N. Y., has taken measures to secure a patent for an improved car ventilator, the nature of which consists in forming a shower of water within a box having a serpentine air passage within it, and so arranged that the air which passes through it into the car will pass through the water and be deprived of all its dust. cinders. &c.

Presents for the Holidays.

It is customary for many parents and employers to make presents to their sons and apprentices at Christmas and the New Year. A more beneficial present cannot be given to a young mechanic, or any young man of a scientific turn of mind, than a volume of the Scientific American, or a year's subscription. Heretofore we have had quite a number of calls for such presents, and we have always had good accounts afterwards of their beneficial effects. No mechanic, artizan, engineer, or practical chemist, can keep up with the intelligence of the age, unless he is a constant reader of a periodical devoted to science and art. The Scientific American is the only weekly periodical of this character on our continent; its subscribers therefore possess peculiar advantages, and know the full value of the old adage, "knowledge is power."

© 1854 SCIENTIFIC AMERICAN, INC

Scientific American.

NEW YORK, DECEMBER 30, 1854.

Curious Clause in the New Patent Bill.

Two weeks ago when reviewing the Report of the Commissioner of Patents, we directed attention to the new patent Bill which was before the Senate last session, the passage of which was recommended in the Report referred to. To a number of sections in that Bill we took exceptions, and suggested that "the sixth and eighth should be stricken out, as they were contradictory, and would lead to trouble if passed in their present shape." Quite a controversy was maintained some weeks since between two rival daily papers in this city respecting who was the author of that very astute political maxim, "language is useful for disguising thoughts." This controversy ended in proving that it belonged practically to not a few individuals of ancient and modern days, but the person most celebrated for carrying it out was that prince of politicians—Talleyrand. We must say that the sixth section of the new patent Bill appears to have been drawn up by that generalissimo of diplomatists, for if ever language was employed in any instance to disguise intentions, it has been so, we regret to say, in this section. We read it over a number of times, but could not really understand its meaning. It was evidently contradictory to the eighth section, and we were positive there was no Senator so dull as not to see this. We therefore thought that some policy was couched under its language which was perfectly plain to its author, though not to us, and of this we are now positive. The object of this section of the Bill is to allow the introduction of foreign inventions by any person; thus changing the whole policy of our patent system, which provides for patents to original inventors only. This new Bill contains a provision for the granting of patents without taking oath, as is now the case, the applicant being only required to affirm that "what he has described and claimed in his specification has not been invented or discovered by any other person in *this* country, nor has been patented or described in any publication prior to the discovery by *himself*, (or prior to the date of his application) if he chooses to state it in this manner." This clause contains a check against the stealing of American inventions, and only embraces the introduction of *secret* foreign inventions, or those that have not been patented abroad. Apparently, very little objection can be urged against such a policy, and for our own part, we believe it would considerably increase the business of patent agents, but such views should never be suffered to outweigh those of right and justice, in the mind of any honest man. No person who is not the inventor, can introduce a secret foreign invention, unless he steals it, and any other foreign invention must be public property, free to every American citizen, and for which no man should receive a patent. Our patent laws were made to encourage improvements in the useful arts—to offer inducements to inventors, not to reward those who have better faculties for abstracting the inventions of others, than producing any of their own. These are our reasons for objecting to this change proposed in the principles of our patent system by the new Bill, and we therefore hope the Senate will strike out the section to which we have referred.

Lectures and Good Reading.

For some years past, it has been very fashionable to have courses of lectures in every city and in almost every village in our country, during the winter season, but the passion for such means of mental excitement, we understand, is cooling off, and we do not regret it. In saying this, we are not opposed to the method of communicating information by oral teaching; we believe it has claims of the highest character upon every thinking mind, but then the great majority of lectures are nothing better than literary trash.—Except in rare instances, more profit can be derived from reading, than hearing lectures, and it is to this subject we wish to direct attention. As a necessary consequence, a single lecture on any subject must be very superficial, whereas, the whole of the points taken up by any author, to read correctly, must be discussed in a connected manner, and thus clearly set before the mind. This is the reason why good authors make more thinkers than great orators. During the winter evenings, let us enjoin upon our young mechanics and engineers the benefits of good reading. Besides the advantages to be derived from communicating directly with the author you are reading, you have also the advantage of doing so at a comparatively small cost, so that the want of means need not be pleaded by any one. We speak somewhat feelingly upon this subject at present, because we know that by far too many—both old and young—throughout our cities and villages, seem to despise this most rational means of mental enjoyment, and as a consequence, "are pleased with a rattle and tickled with a straw." A correspondent writing to us from Lockport, N. Y., says, "there seems to be no spirit among the majority of our mechanics for scientific information. A person who comes here with a baboon or a monkey, will draw fuller houses than a teacher of drawing or mathematics, and while they will spend a great deal upon such miserable raree-shows, they feel too poor to subscribe for such papers as the SCIENTIFIC AMERICAN." We believe this is a too true story, and it pains us not a little, for the sake of our mechanics themselves. We believe that if they would reflect calmly on the subject, they would soon see how much good they could do themselves by saving that which they expend on worse than foolish enjoyments, in purchasing good papers and books for the cultivation of the mind and the improvement of the judgment.

Sweeping Streets by Machinery.

New York City, enterprising though it may be in business, is "old fogy" enough in its municipal management. Thus Cincinnati has surpassed it in enterprise for Steam Fire Engines, Boston for a Fire Alarm Telegraph, and Philadelphia has left it behind in machinery for sweeping streets. Philadelphia is celebrated for cleanliness, and New York for dirt, and this may account, in a measure, for the introduction of two new machines for cleaning the streets of our Quaker sister city.—These machines were first tried on the 16th inst., and are thus described by the *Ledger*:

"The apparatus consists of a series of brooms on a cylinder, about two feet six inches wide, attached to two endless chains, running over an upper and lower set of pulleys, which are suspended on a light frame of wrought iron behind a cart, the body of which is near the ground. As the cart wheels revolve, a rotary motion is given to the pulleys conveying the endless chains, and series of brooms attached to them, which being made to bear on the ground successively, sweep the surface and carry the soil up an incline or carrier plate, over the the top of which it is dropped into the cart."

One of the machines was made in Philadelphia, and the other imported from England. The latter appears to have done its work well; the other, from some small defect in the construction, which can be easily repaired, gave out. Our Philadelphia cotemporaries do not speak in a very decided tone respecting these machines, but we hope they will prove eminently successful for the purpose intended. It is now about five years since we introduced the subject of sweeping streets by machinery, having received accounts of the success of such machines in Manchester, Eng., and here we have same evidence of the sleeplessness of useful suggestions—they always go forward.

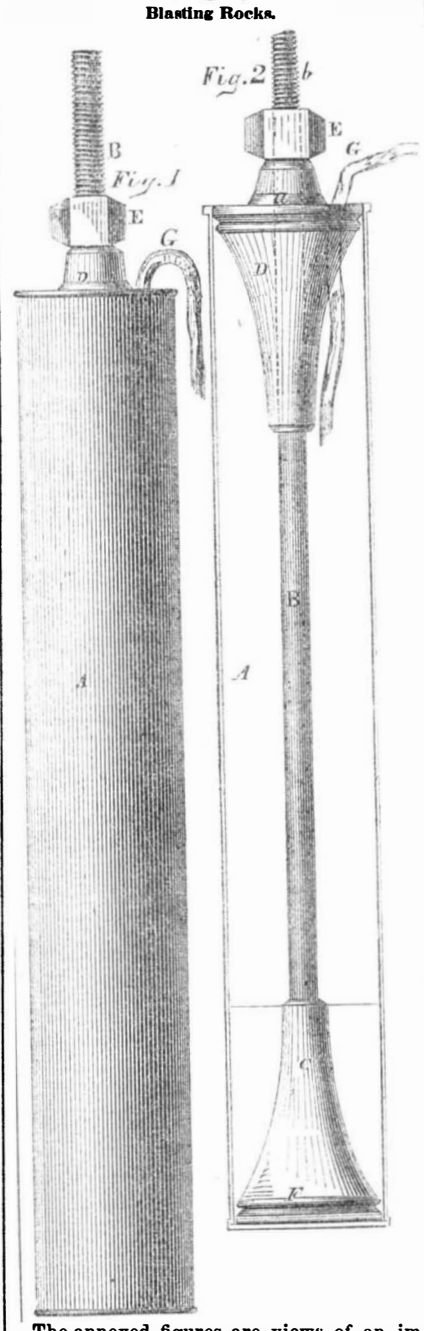
The Beneficial Effects of Patent Laws.

There can be no question of the fact that those countries which afford protection to inventors by good patent laws, are the most progressive in all that relates to the useful arts. The United States, Britain, France, and some of the German States which protect inventors in their rights, stand high above those nations where such laws are unknown. A correspondent writing to us from Bennington, N. H., having recently returned from Mexico, where he resided for two years, uses the following language:—

"They have no patent laws there, and as a consequence are 1,000 years behind us in everything that is useful and convenient. If Barnum would make a collection of their household and agricultural implements he might exhibit them as rare curiosities of ancient times. The people are like the children of Israel when in Egyptian Bondage."

It is a sad thing thus to write of a people who are our next door neighbors.

Blasting Rocks.



The annexed figures are views of an improved implement for blasting rocks, for which a patent was granted to Capt. C. F. Brown, of Warren, R. I., on the 11th of July last.

Figure 1 is an external view of the implement, and figure 2 is a vertical section of the tube which contains the charge. Similar letters refer to like parts.

This invention relates to a new and useful implement for blasting rocks, and consists in placing the powder or charge within a tube or case, between two heads provided with suitable packing, and attached to a rod, by which arrangement the charge is prevented from "blowing out," or obtaining vent in the direction of the line of the hole in which the tube and charge are placed, and the whole effect of the charge is exerted against the sides of the tube or case.

A represents a tube or case constructed of sheet metal, paper, or other material; B, figure 2, represents a metal rod having a conical metal head, C, permanently attached to its lower end. The diameter of the base of the head, B, corresponds to the diameter of the bore of the tube or case; D is also a conical metal head placed loosely upon the rod. B, in an inverted position, the rod passing through a circular hole, *a*, which is made longitudinally through the center of said head, represented by dotted lines, figure 2. On the upper part of the rod, B, a screw thread, *b*, is cut, and a nut, E, works thereon. F F are metallic rings which encompass the heads near their bases, and serve as packing; G is a piece of fuse, the lower end of which is attached to the small end of the head, D, and the upper end is passed through an aperture, *c*, in said head, and projects a suitable distance above the tube, A. The implement is used in the following manner:—The rod, B, is inserted within the tube, A, the head, C, resting upon the bottom of the tube. The necessary amount of powder is then poured within the tube; the head, D, is placed down upon it, and secured at that point by the nut, E, which is screwed down against D. The space within the tube between the two heads, C D, is therefore filled with powder, and the tube is inserted within the hole which is drilled in the rock in the usual manner, the diameter of the hole corresponding to the diameter of the tube, A; the fuse, G, is to be sufficiently long to reach the top of the hole. The powder being ignited by means of the fuse, the rings, F F, are forced tightly between the heads and the tube, and effectually close the top and bottom of the tube, and as the powder, when ignited, will act with equal force against each of the heads, C D, it is evident that no vent can be obtained in a direction in line with the hole in the rock in which the tube or case is placed, or as commonly expressed, the charge cannot "blow out," and the whole effective force of the powder will be exerted against the sides of the tube, and the splitting of the rock rendered certain. The heads are made of conical form in order to deflect, and thereby diminish the force of the power exerted against them. The packing, F F, may be formed of rings similar to the metallic packing of a piston for steam engines. The rod, B, should be sufficiently thick to prevent breaking, and to resist the force of the power exerted against the two heads. The above implement is effective, and rocks may be blasted with much greater facility than by the ordinary mode, no tampering or packing of clay being necessary to confine the powder within the hole. The implement may be used repeatedly, as it cannot be projected to any great distance from the spot where used.

The *Northern Star*, of Warren, R. I., contains a notice of the operation of this improvement witnessed by five persons, on the 24th of October, by which one pound of powder moved one hundred tuns of rock. Cartridges are prepared for using it, so that no tamping is required, and it therefore saves both time and labor, and is also more safe for those who blast.

More information may be obtained by letter addressed to Capt. Brown.

The *Plow, Loom, and Anvil* will oblige us by stating where, in the SCIENTIFIC AMERICAN, it found the article "Science in Blacksmithing," over which it affects some merriment in its last issue. Having no knowledge of writing such an article ourselves, we are curious to know where it is to be found, inasmuch as it is credited to us.

$570 IN PRIZES.

The Publishers of the SCIENTIFIC AMERICAN offer the following Cash Prizes for the fourteen largest lists of subscribers sent in by the 1st of January, 1855.

$100 will be given for the largest list,
$75 for the 2nd, $35 for the 8th,
$65 for the 3rd, $30 for the 9th,
$55 for the 4th, $25 for the 10th,
$50 for the 5th, $20 for the 11th,
$45 for the 6th, $15 for the 12th,
$40 for the 7th, $10 for the 13th,
and $5 for the 14th

The cash will be paid to the order of each successful competitor; and the name, residence, and number of subscribers sent by each will be published in the SCIENTIFIC AMERICAN, in the first number that issues after the 1st of January, so as to avoid mistakes.

Subscriptions can be sent at any time and from any post town. A register will be kept of the number as received, duly credited to the person sending them.

☞ See new Prospectus on the last page.

© 1854 SCIENTIFIC AMERICAN, INC

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING DECEMBER 19, 1854.

MACHINE FOR CUTTING IRREGULAR FORMS—Charles P. Bailey, of Zanesville, Ohio: I claim the hinging orpivoting of the rest to the table, and uniting the carriage that carries the block and pattern thereto, by means of a mandrel which may be turned at pleasure by a helically grooved rod or shaft, for the purpose of cntting twisted or spirally-formed pieces, as they pass the cutter head, substantially as described.

CONDENSERS—S. W. Brown, of Lowell, Mass.: I disclaim a valve, as such, the end of which comes directly in contact with a flat stationary projection, which hoists the whole snrface of the valve at once, as is operated by excess feed water apparatus designed to be used in steam boilers.

I claim, first, the lever valve, C, in combination with the inclined plane on the top of the movable lever, F, or with a stationary incline plane, for the purpose of opening this lever valve, C, with an increased power, when the condenser descends by the yielding of the tube to which it is attached, this yielding being caused by the weight of the water of condensation, the valves andsurfaces to open them being constructed and operated essentially in the manner and for the purposes set forth.

Second, I claim suspending the condenser by a tube of metal or other substance so remote from the bearing on which this tube rests, that it will yield or spring downwards by the weight of the water of condensation sufficiently to open a valve or its equivalent, which allows of the escape of this water and retains the steam.

METAL SEPARATORS—T. J. Chubb, of New York City: I claim the arrangement of a series of guide plates or compartments, B B, above the sieve; a series of tubes or plates, T, below the sieve, which I call a sieve bed; the bellows, C, for supplying the blast, the guide plates or scrapers, g g, operated as and for the purpose set forth.

CLEANING SEED COTTON AND FEEDING IT TO THE GIN—Major B. Clarke, of Newman, Geo.: I claim the combination of a series of parallel bands, j, operating as a feeding apron, with toothed roller, m, the teeth being so arranged on the roller, as to pass between the feeding bands, whilst the arms of a beater are so arranged as to pass between the teeth of the said roller and strip them of the cotton as it is carried forward, substantially in the manner and for the purpose described.

DOUBLE-ACTING FORCE PUMP—David W. Clark and S. H. Gray, of Bridgeport, Conn.: We claim the combination of two pistons and piston rods with one pump barrel and one brake, when one of the reds is made to pass through the hollow interior of the other, and when both rods are connected with the brake by means of the connecting links and cross levers, as described.

BILGE SUPPORTERS FOR HOLDING VESSELS IN DOCKS—H. J. Crandall, of Boston, Mass.: I claim the making of bilge supporters with standards and braces, with rocker movable joints, with the sheaves or rollers, and rails for the bilge supporters to rest or move upon when not loaded, and for the use of dry sectional or railway docks, substantially as set forth.

GUARDS FOR FERRY BOATS—Daniel Fitzgerald, Thomas Rogers, and W. C. Walker, of New York City: We claim, first, the use of the cat head and connected apparatus to effect, at the arrival of the boat, the removal of the guard, in the manner substantially as described.

Second, the removal of the guard by the action of the boat against the apparatus, substantially as described.

Third, the self-closing of the passage by the withdrawal of the boat as described.

This invention consists in arranging a fence at the dock or on the boat, to stand as a guard to prevent passengers in their attempts to jump on the boat after it has started, falling into the water, and when the boat has reached the landing, to drop down entirely out of the way, and give space to pass.

CLOVER HARVESTERS—J. S. Gage, of Dowagiac, Mich.: I claim gathering clover and other seeds from the standing stalks, by means of a hollow cylinder, D, provided with a series of toothed bars, E, arranged as shown, or otherwise, so that the teeth of said bars will, as the cylinder rotates, be forced outward through holes, b, in front of the cylinder, and comb the seed and chaff from the stalks, the teeth being drawn within the cylinder when at its top, and the seed and chaff stripped from them, so that it may pass into the box or body, A, as described.

GRAIN MILLS—G. W. Grader and B. F. Cowan, of Memphis, Tenn.: We claim regulating the feed by the combination of the spring, A, and the eccentric jut, E, in the manner set forth.

DIRECT-ACTION WATER WHEEL—Stephen Hadley, Jr., of Lyman, N. H.: I claim, first, the form and construction of my wheel as follows, making the surface upon which the buckets are affixed, concaved or bell-shaped, in combination with spiral-formed buckets, so curved as to meet the water on their face, perpendicularly, its course, and gradually diminishing their capacity from the center to the periphery. I do not claim either the cap or concave separately, whether it be my original invention or not, as the whole are required to produce the best effect, which I obtain.

Second, I claim the adjustable collar, bevel wheels, and gear wheel, combined to tram and sustain the wheel, and adjust it perfectly to the stationary parts, as set forth.

Lastly, I claim in combination with the described wheel, the stationary cap enclosing the moving buckets, as specified.

MACHINES FOR STRAIGHTENING HEAVY METAL BARS—I. B. Howe, of Northfield, Vt.: I do not claim the combination of a screw, strap, beam, and slides, as arranged, constructed, and made to operate as described in the patent of the said Williston.

But I claim the combination of a lever beam, sliding fulcrum, operating screw, and sliding yoke or hold fast, as constructed, and made to operate, as specified, whereby I am enabled to obtain the advantage of leverage in combination with a screw power for bending the rail when the machine is applied thereto, as stated.

REGISTERING DYNAMOMETERS—W. B. Leonard, of New York City: I am aware that in a French machine devised for registering the power necessary to draw wagons for a given length of time over a given length of road, the force necessary for draught has been multiplied by the velocity of the vehicle by means of a revolving disc and an oscillating friction wheel, such as is described: I do not therefore claim in the broad, multiplying force by velocity, by mechanical means.

But I claim the registering dynamometer for rotary motion, which is made up by the combination of an indicating dynamometer for rotary motion, with a registering apparatus by means of a controlling connection constructed and arranged substantially in the manner described.

SASH FASTENERS—Charles Merrill, of Malden, Mass.: I do not claim a sash fastener composed of a notched and wedge-shaped catch, to be applied to the top of the bottom bar of a window sash, and a slotted catch plate connected to a thumb rod having a spring, and arranged above the top surface of the upper bar of the other window sash.

But I claim my improved arrangement of a wedge and its mortice plate with a spring bolt and its catch plate, so as to operate substantially in the manner and for the purpose of drawing the sashes together when fastened with a spring bolt, substantially as specified.

MAKING SUGAR MOLDS—James Myers, Jr., of New York City: I claim filling the space between the base band and the mold case with molten iron or other suitable metal in such a manner that the metal, by uniting with the base of the mold case, will, when cooled, form a complete and durable armor for the same, substantially as set forth.

COMPOSITION FOR TANNING—George Reynolds, of Bangor, Me.—I claim the described composition, consisting of muriate of soda, alum, and sulphuric acid, this composition to be dissolved in water for treating hides, substantially as set forth, or converting them into leather without depilating them.

CUT NAIL MACHINES—J. P. Sherwood, of Fort Edward, N. Y.: I claim, first, connecting the tube, J, to a vibrating carriage, and combining said tube andcarriage with the sliding plate, F, the lever, E, the hook, m, the cam wheel, B, and shaft, A, in such a manner that the forward end of said tube will be elevated during the first half of its semi-rotary movement, and be depressed during the latter half of said movement, and then be firmly held in a depressed position a sufficient length of time for a nail to be cut from the nail plate, substantially as set forth.

Second, I also claim the combination of the flaring jaws, I I, with the end of the tube, J, in such a manner that they can be so adjusted as to enable them to unerringly guide a nail plate of any width, to the cutters, when the machine is in motion, and allow the end of the rail plate holder to pass in between said jaws, substantially as set forth.

Third, I also claim combining the rail plate holder, e, with the arm, L, the rack bar, K, the spring, f, the pinion, H, the lever, D, the cam wheel, C, and the shaft, A, or their equivalents, in such a manner that the nail plate holder will be withdrawn at the moment that its semi-rotary movement commences, and will be pressed forward at the moment that its semi-rotary movement ceases, substantially as set forth.

HOLDING VESSELS BY THE KEEL IN DRY AND OTHER DOCKS—JonathanSmith, of Neponset Village, Mass.: I claim the arrangement of the keel pawl, as described, that is to say, a keel block which rests on and is confined to a bearer, and a pawl which slides in the straps or hasps, D and E, by which straps it is confined to the keel block, B, and the bearer, A, a rope or chain attached to the pawl and led through a block to the side of the dock, by which the pawl can be hauled down, also a rope attached to the pawl, and led through a block to the side of the dock, by which the pawl may be raised.

SHINGLE MACHINE—J. J. Speed, Jr., and John A. Bailey, of Detroit, Mich.: We do not claim the employment or use of reciprocating frames with cutters attached, irrespective of the feeping bar or catch, neither do we claim the cutters.

But we claim ohe combination of the reciprocating frame, B C, and feeding bar or catch, L, the reciprocating frames being provided with cutters, h h h, u u u, and j j, and the feeding bar or catch, giving the shingles an accelerated motion while passing berween the cutters, j j, the above parts being otherwise constructed and arranged as shown and described.

REVOLVING FANS FOR APARTMENTS—LouisStein, of New York City: I claim giving the combined revolving and flapping motion to the wings of a fan for cooling apartments, by having the wings hinged by one edge to arms projecting from a rotating shaft, and provided with crank arms, which, as the arms revolve, strike against fixed tappets or cams to give the flapping motion, substantially as specified.

MACHINES FOR PACKING FLOUR—Samuel Taggart, of Indianapolis, Ind.: I do not claim the spiral flanch or screw, D, separately for packing flour, for that has been previously used. Neither do I claim a clutch for communicating motion to the packing shaft, irrespective of the peculiar construction and arrangement of the one shown and described.

I claim the employment or use of the clutch, G, formed of a cylinder or thimble, G, provided with a collar, K, as shown, and having studs or nibs, f f, on its inner periphery, which studs or nibs act against spiral flanches or nibs, e e, on the packing shaft, C, said cylinder or thimble having a constant or rotating motion given it. The several parts of the clutch being otherwise constructed, arranged and operating in the manner and for the purpose as set forth.

LIFE-PRESERVING SEATS—Nathan Thompson, Jr., of Williamsburgh, N. Y. Patented in England Sept. 13, 1854: I claim the combination of adjustable buoyant bottoms, acting and secured substantially as described, with a buoyant top whereby is constituted a life-preserving seat, having properties substantially as set forth.

BOOT CRIMPING MACHINES—Gray Utley, of Chapel Hill, N. C.: I am aware that crimping machines have been made in which two jaws were furnished with two corresponding series of projecting ridges, between each pair of which the leather is pressed in succession by the crimping board, but these successive ridges being formed upon one and the same rubbing jaw, have of course no independent motion or pressure upon the leather. Disclaiming therefore this or any essentially equivalent device.

I claim the double row or series of independent and disconnected angular shaped rubbers, placed opposite each other, and movable in horizontal guides to and from the center, a spring behind each rubber effecting a gentle pressure upon the leather as it is pressed down between the rubbers by a crimping board, and each pair of rubbers retaining their pressure towards the center and from the edge of the crimping board upwards, stretching the material until it shall have passed successively through the entire series, substantially as set forth.

OVEN COOKING RANGE—D. P. Weeks, of Malden, Mass.: I claim my improved arrangement and combination of flues by which the smoke is carried around and in contact with and made to heat the elevated oven of a cooking range, such causing the smoke to be led first against the rear half or portion of the under surface of tee bottom plate of the oven, next against the front half or portion of the same, and in opposite directions to the two vertical sides of the oven: next upwards against the front half or portion af the external surface of each of the side plates of the oven; next downwards in contact with the remainder of each of the side plates of the oven, next into and upwards through a flue disposed directly against the rear surface of the rear end of the oven, and thence finally over and against the entire upper surface of the top plate of the oven, and thence through the discharge opening, substantially asstated, the same enabling the oven not only to be thoroughly heated on its two sides, its bottom, top, and rear end, but to be so with a facility that insures quickness and strength of draught around it, whereby good combustion in the fire place is obtained and maintained.

SPRING BED BOTTOMS—Wendell Wright, of New York City: I claim the manner, as described, of making the elastic bottom of bedsteads, of wood, and in a great number of separate and independent square, or other suitable shaped sections, in combination with the manner shown and described, of arranging said sections, for the purposes set forth.

MACHINES FOR FORGING HORSE SHOES—Robert Griffiths, of Alleghany City, Pa., and George Shield, of Cincinnati, Ohio, (assignors to Robert Griffiths aforesaid): We claim, first, the arrangement of the sliding former and rising griper, or their equivalents operated so as to gripe the bar both edgwise and flatwise at its mid length, substantially as described.

Second, the spring projecting plates or cheeks on the one side of the dies of the bending jaws, acting in connection with the face plate of the sliding shearing apparatus on their other side, for the purpose of preventing the metal from bending laterally whilst being turned around the former.

Third, we claim the channeled bending jaws for the purpose of confining the outer margin of the shoe during the process of grooving and punching; the side of the shoe being supported by the convex shoulders of the male former, substantially as set forth.

Fourth, the arrangement described of the bending jaws, and swaging die for the purpose of imparting the desired relative width and thickness at every part, and of clamping it when thus formed, whilst it is grooved and punched by a separate die working around the swaging die.

Fifth, the retaining of the shoe in the gripe of the bending jaws by means of the cams which operate them having a portion of their periphery, the arc of the circle described from their center of motion, or the equivalents of these devices, until the grooving and punching bits and male former are withdrawn, in order that the shoe may drop freely the moment it is released from said jaws.

GRAIN AND GRASS HARVESTERS—W. F. Ketchum, (assignor to R. L. Howard,) of Buffalo N. Y.; I claim the enlargement of the driving wheel for the purpose of changing the mowing machine to a reaping machine.

LEATHER SPLITTING MACHINES.—Elisha Pratt, (assignor to himself and H. P. Upton,) of Salem, Mass.: I do not claim the use of rolls composed of sections of rings strung upon a shaft, when the sections and shaft are allowed to revolve independently of each other.

But I only claim the same in combination with the springs, t, or their equivalent, and when they are so united with the shaft which carries them, that while they are permitted to rise and fall to accommodate themselves to the varying thicknesses of the leather, they are at the same time forced to revolve with the shaft and feed the leather into the machine, as described.

Second, I claim the feed apron, N, non-elastic in the direction of its length, and elastic in the direction of its thickness, constructed substantially as described for the purpose set forth.

TURNING PRISMATIC FORMS—Milton Roberts, (assignor to himself & H. E. Pierce,) of Belfast, Me.: I do not claim a rotating cylinder of cutters in combination with a carriage for holding the block when the motions of the block and of the carriage are governed by the hand of the operator.

But I claim the machine described, for turning prismatic forms, consisting essentially of the cylinder of cutters, the mechanism for rotating the block intermittently, and for giving the transverse motion to the revolving cylinder, the whole operating automatically in the manner and for the purpose set forth.

SEWING MACHINES—A. B. Wilson, of Watertown, Conn., (assignor to W. P. N. Fitzgerald, of Washington, D. C.): I claim the device described, in a sewing machine, for feeding the cloth along, consisting of a bar furnished with points or notches, having a vertical or up-and-down motion for fastening the cloth upon and releasing it from said bar by striking it against a plate or spring, and a lateral motion, or motion forward and back, for feeding the cloth along after each stitch' substantially as set forth.

Tractive Power of Locomotives.

The following useful information for railroad engineers, is taken from Zerah Colburn's *Railroad Advocate*:

"If the wheels of a locomotive were *geared* into tooth rails, we should say that its power was the force with which its wheels could be made to turn, or the weight or force which, applied at the rims of the wheels, would prevent them from turning. But if, in another case, where the wheels revolved upon ordinary smooth rails, the wheels should often *slip* in turning, thereby wasting a part of the "power," we should say that the effective power of the engine was limited by the *friction* or *adhesion* of its driving wheels. Hence the terms *Tractive Power* and *Adhesive Power* are proper, the first meaning the revolving power, the second the progressive power of the engine. We shall at present give the rule for calculating the tractive power of the engine.

Multiply the diameter of the cylinder, in inches, by itself; multiply the product by the effective pressure of steam on the piston, in pounds per square inch, (estimated or measured): multiply this last product by the length of stroke in inches, and divide the whole by the diameter of the driver in inches. The quotient is the power with which the wheels revolve, or the tractive power of the engine. A weight equal to the quotient, if hung upon the rim of one of the driving wheels, or one half the quotient hung upon each of the two drivers, would prevent them from turning with assumed pressure of steam.

75 pounds per square inch of piston is about the pressure of steam which can be safely calculated in reckoning the full power of an engine; although it is of course possible to use higher steam if the boiler would supply it fast enough.

EXAMPLE—What is the tractive power of an engine with 16 inch cylinders, 75 lbs. of steam, 22 inches stroke, and 54 inch drivers?

16 inches diameter of cylinder.
16

256 square of diameter.
75 lbs. per inch.

19,200
22 inches length of stroke.

54)422,400 (7822 lbs. ANS.

To know the power of the engine to draw a required load in tuns, we must know the resistance of each tun. This varies with the speed of the train, etc. On a level road, at a slow speed, the friction and concussions of loaded trains are from 7½ to 11 pounds per tun of the train. With a resistance of 10 pounds per tun, the above engine would draw 782 tuns on a level, equal to about 49 cars, weighing, loaded, 16 tuns each. It is evident that unless the *friction* or *adhesion* of the drivers upon the rail is equal to the tractive power, the latter can never be fully and usefully exerted. It is necessary, then, to know the amount of this adhesion, which can be calculated upon under ordinary circumstances.

The adhesion under the best circumstances, with dry, clean rails, is about one-fifth of the weight pressed by the driving-wheels upon the rails. Cases are, however, known in which this limit has even been exceeded.—Upon the Baltimore and Ohio road, engines have been tested by loads on steep grades, in which the resistances were known to be as great as three-tenths of the weight on the drivers. This was with chilled cast iron tires and without using sand.

But from one-fifth, the adhesion is often reduced by wet or greasy rails, to less than one-twelfth of the weight on the drivers.—Probably *one-sixth* may be taken as the average ordinary effect.

Having first determined the tractive power, we are thus prepared to learn what weight an engine should have upon its drivers, to make that power available. The engine assumed for the example, in our last article, had 7,722 lbs. of tractive power. Hence six times this sum would be the least weight on the drivers. This would be 46,932 lbs., or about 23½ tuns. This would be about the entire weight of the engine in running order; hence the whole weight should be upon the drivers. It would be a gross blunder to proportion an engine with 16 by 22 cylinders, and 54 inch wheel—weighing 24 tuns—and to place one-third or one-half this weight on a truck. If a truck was required, the weight on the drivers would require to be increased, or the cylinder diminished in size, or the driving wheel enlarged in diameter. There should be an equilibrium between tractive and adhesive power.

It may be called an accident, or a concurrence of physical facts, that the necessary machinery for generating and applying steam power in ordinary locomotives, involves by its own weight the necessary adhesion for making it available. If an immense power could be raised and applied in a small space, and with but little *weight*, we should have to resort to toothed rails, or friction rails, or something of the sort. Generally, the adhesion of the full weight of our engines would be in excess, the weight of the engine beyond what was necessary for adhesion being carried upon the *truck*.

Suspending the Laws of Gravitation.

Since we published the article of Septimus Piesse, on page 112, wherein he suggested a cheap method of traveling by suspending the laws of gravitation, we have received quite a number of communications on the subject, all of which afford poor consolation to our London philosopher, so far as it regards any hope of converting us Americans to his views. These letters are too numerous to publish, although some are exceedingly rich in wit and pungency, and might afford many of our readers some funny and useful ideas. It is perhaps unnecessary for us to add—but, nevertheless, we will do it—that we have strong faith, at present, in the opinion of old Bishop Wilkinson, that man has been denied wings and the power of navigating the air because he is such a wicked creature, and would only use them for mischief. Whenever any of our friends—Septimus Piesse among the number—succeed in suspending the laws of gravitation so as to travel in an easy manner to Australia, by ascending into the atmosphere and waiting above till that country comes round, then coming down upon it, like a hawk upon a pigeon, (or by any other method of flying,) then we are free to admit we will suspend our faith in the old scientific Bishop.

Boring Artesian Wells.

From the great number of able mechanics now residing in California, likewise the great number of scientific men who have made it their home, we may reasonably expect, in a short time, a great amount of new and useful improvements in science and the arts, from the borders of the Pacific. A number of patents have already been granted to residents of California, and more may soon be forthcoming. Among the number of those who have taken measures to secure a patent, is Edward T. Steen, of San Francisco, for an improved implement for boring artesian wells—something which will come into extensive use in many parts of our great country. It consists in the employment of a drill which is constructed and rotated in a peculiar manner, and used in connection with a suction and lift pump, which is operated by the shaft that operates the drill. At every stroke a portion of water and sand are lifted so as to clear the surface for the action of the drill.

Water in Flour.

Professor Beck, of Albany, has recently analyzed samples of flour from various sections of the country—finding an amount of water in each, ranging from 11 54-100 per cent., to 13 80-100 per cent.

© 1854 SCIENTIFIC AMERICAN, INC

TO CORRESPONDENTS.

A. A. W., of Tenn.—Use lead pipes tinned inside for your water; or else use cement pipes. You can dye orange on wool with cochineal and yellow oak bark; one half ounce of cochineal and two ounces of bark to the pound of clean wool. Use a wine glassful of the muriate of tin and two ounces of cream of tartar to ten pounds of wool. Boil all together for half an hour in a clean copper boiler.

L. G. W., of Ohio—We fail to discover any patentable feature in your cider press.

J. W., of Texas—We would like to see you condense a sufficient quantity of gas in a copper reservoir to mount up and carry the mail bags at the rate of 300 miles per hour, to California. If you do this you certainly will obtain a patent, but we believe that neither you nor any other person can do it.

J. H. J., of Mo.—Babbit's patent has not expired. For $1 we can send you his claims.

G. W., of Vt.—Your idea of exhibiting the movements of R.R. trains is impracticable.

S. C., of Va.—Your ideas of a propeller are very antiquated: we cannot understand, without a sketch, your alleged improvement in lathes for smoothing barrels, but if we mistake not, William Trapp's patent covers essentially the same device.

J. T. D., of N. Y.—We could not very well arrange the tables for publication, therefore we replied to you as we did; it would have given us pleasure to comply with your wishes if we could have done so.

E. R., of La.—We do not know where you can procure such a machine as you speak of; you had better write to S. C. Hills, No. 12 Platt st., about one.

J. W. B., of N. Y.—We have only five numbers of those you want in Vol. 8. The "Varnisher's Companion" is as good a work on the subject as we are acquainted with.

J. W. W., of Mich.—Your apparatus for shifting bands on pulleys does not seem to possess any thing patentable.

D. C. W., of Ohio—Can you give us any more particular information respecting "the new power about to be discovered?" We would like to know more about it. We do not exactly understand what you mean in the concluding part of your letter.

G. G. McC., of N. B.—We think your machine for graduating circles may have some patentable points in it: but remember, it is the means of doing the thing, not the circle regularly graduated that is patentable. The House Telegraph is operated by keys like a piano, and prints in Roman characters. We hope the patent law will be amended this winter, but are not sure whether it will be done.

F. W. E., of N. Y.—The only proper way to adjust eaves troughs for slate roofs, is to make them broad enough, so as to set them so far down below the edge of the slate, that the ice may be cut off easily; this is the only feasible plan that suggests itself to us. To make the best quality of candles the process is somewhat tedious; Morfit's book on the subject, sold by H. Cary Baird, Philadelphia, will give you the proper information. The price we believe is $3.

M. C. P., of Md.—We cannot give you the information desired about manufacturing corn starch, or we would cheerfully do so. We think experiment would soon lead you to discover it. Your paper has been regularly sent from this office.

C. D., of N. J.—We have never heard of a bullet being used for cannon constructed as you propose; it would make a good one, but would be expensive. The Minie ball is cast hollow at the butt, and has a conical wooden peg placed partly in it, for the purpose of being driven further in by the powder to force out the lead and prevent windage.

J. M. W., of Mich.—The improvement you describe in water wheels is quite old. We have seen the same thing several times. We do not exactly understand the pump which you describe. It seems to be new, but we shall not be able to decide until we can examine a sketch of it.

A. N. N., of Ind.—Your anti-sufficator does not strike us as being patentable. Your steam cutter we think is patentable.

A. G. A., of Ill.—Yours of the 11th inst. is received; we will examine the sketches of the stone machine whenever you can place them in our hands.

T. B., of Pa.—You cannot patent a picture frame made of tin or zinc in the manner described by you.

S. O., of Ind.—Machines for cutting corks are in use, and have been secured by patent. We presume you can get the information you desire of the American Cork Co., No. 91 Jane st., N. Y.

J. B., of Albany—Your brick press, we believe, is new, useful, and patentable, but as you are not a citizen the patent fee is $500. Your drawings will be taken care of.

J. C. T., of Mass.—We would be very much obliged to you, or any other person, for a simple rule to calculate the power of a machine by a belt of ordinary tension, given width and velocity.

T. C. C., of N. Y.—The idea of feeding paper to a printing press in an endless sheet, is well known, and if your improvement consists in this, only you are advised to drop it.

Rev. C. W., of Pa.—You are not the only clergyman who has made inventions. We often receive sketches from members of your profession. You must consult your own feelings as to the propriety of engaging in speculations of this character. If you will send us a proper description of your improved gun we will examine it. Projectiles of war will always be used until the spirit of Christianity is more prevalent in the world than it is at the present time. Agriculture is suffering for the plow-share and the pruning-hook.

E. R. B., of O.—In the Journal of the National Academy, Paris, for September 1851, is an engraving of a capstan constructed upon the same principle as yours. It is not patentable in view of this fact.

J. G. S., of Mo.—Your favor remitting $20 came safe to hand, and the argument in your case will be submitted without delay, and the result duly communicated.

H. P., of Mo.—Your communication upon the "Lateral motion of the Earth" will be examined when we get time to take it up.

D. T., of N. Y.—Your improved clothes horse is constructed upon a plan new to us, and we should think the arrangement to be patentable.

A. C. E., of Ct.—Your theory is at variance with the first principles of philosophy, and could not be made available until the laws of force and motion are changed. You would not be able to suspend the laws of nature for the accommodation of your theory.

E. M., of Pa.—If you apply for a patent before the invention has been publicly used two years, you can secure a valid patent, if it is found to possess novelty of a patentable character.

W. H., of Mass.—When your patent issues you can communicate with us in regard to the engravings. We hope the case will soon be decided, in your favor of course.

I. W., of Wis.—It is no new device to construct a water wheel or rotary engine with sliding buckets, as shown in your sketch. The principle is old and well understood.

J. H. H., of Ohio—"Reid on Clock and Watch Making," is said to be a very useful work. It is sold by Blackie & Son, 117 Fulton st., for about $5.

J. F. H., of Ill.—Your railroad frog is not new. Mr. Carlton Dutton obtained a patent for the device in 1849.

W. H., of Vt.—If you can raise water to any required hight without machinery, and then apply the same, when so raised, to drive machinery, you have accomplished some thing which appears to us impossible.

W. G. H., of Pa.—We do not believe you can obtain a patent for your method of purifying wine, &c. Are you sure that it frees it from all the alcohol.

E. E. B., of Mich.—The pitch, oil, and resin are certainly in a melted state in preparing the artificial stone. The other ingredients are then stirred in. It can be placed either in sun or shade.

J. L. K., of N. J.—A hollow mandrel for turning out handles is already very much used for plain work. We do not think there is anything patentable in the modification you propose.

J. B. M., of Geo.—We have received the certificates in regard to your case, and have submitted them to the Patent Office.

C. B. B., of Ill.—A patent could not be obtained on "a simple wrought iron frame for a harvesting machine." You have a right to use any well known material for such purposes.

J. B., of Pa.—The idea you suggest in regard to an opening in a stove pipe near to the ceiling, for the purpose of carrying off impure air, gas, etc., is very good, but it is not new.

Money received on account of Patent Office business for the week ending Saturday, Dec. 23:—

S. S. M., & others, of Ct., $25; T. J. K., of Pa., $30; R. S., of N. Y., $30; I. R., of O., $74; S. G., of R. I., $30; C. V. C., of N. Y., $55; A. W. G., of N. Y., $28; F. B. H. & Co., of Ind., $25; J. C. T., of N. J., $35; B. & C., of Tex., $10; B. B. B., of Tenn., $30; H. S. F., of Pa., $30; G. A., of N. Y., $30; A. M., of Ct., $10; J. T., of Pa., $30; M. B., of L. I., $25; B. X. B., of Pa., $25; L. T., of N. Y., $10; A. C. B., of Ala., $60; T. W., of Ind., $25; P. & B. of O., $35; W. L., of Md., $30; C. T., of N. Y., $30; C. A. M., of Iowa, $24; W. D. T., of L. I., $95; W. H., of N. Y., $20; H. W. B., of N. Y., $35; W. B., of L. I., $27; H. H., of Mass., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Dec. 23:—

S. S. M., and others, of Ct.; J. U. W., of N. Y.; W. B. of L. I.; M. B., of L. I.; H. H., of Mass.; A. W. G., of N. Y.; W. D. T., of L. I., (2 cases); H. W. B., of N. Y.; W. H., of N. Y.; H. & Van D., of Ind.; C. T., of N. Y.; T. W., of N. Y.; J. D., of N. Y.

Important Items.

BACK NUMBERS AND VOLUMES—We have the following numbers and volumes of the SCIENTIFIC AMERICAN, which we can supply at the annexed prices:—Of Volume 5, forty numbers; price in sheets, $1; bound, $1,75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Volume 7, all; price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, complete in sheets, $2; bound, $2,75.

☞ We are able to furnish all the back numbers of the present volume of the SCIENTIFIC AMERICAN, and to new subscribers we shall continue to send the back numbers as long as we have them, so as to render their volumes complete.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

PATENT LAWS, AND GUIDE TO INVENTORS—We publish and have for sale, the Patent Laws of the United States—the pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office Price 12½ cents per copy.

FOREIGN SUBSCRIBERS—Our Canada and Nova Scotia patrons are solicited to compete with our citizens for the valuable prizes offered on the present volume. [It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to pre-pay on postage.]

RECEIPTS—When money is paid at the office for subscriptions a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgement of the receipt of their funds.

Terms of Advertising.

4 lines, for each insertion,	$1,00
8 " " "	2,00
12 " " "	3,00
16 " " "	4,00

Advertisements exceeding 16 lines cannot be admitted, neither can engravings be inserted in the advertising columns at any price.

☞ **All advertisements must be paid for before inserting.**

FELTING FOR STEAM BOILERS AND SHIPS—Manufactured by J. H. Bacon, Winchester, Mass., for sale at W. & J. MORRISON'S, No. 9 Maiden Lane, N. Y., and T. C. BACON & CO.'S, corner of Union and North sts., Boston, Mass. 15 5*

GLEASON'S PICTORIAL.—This favorite illustrated journal will appear after the first of January, vastly improved. An entirely new and beautiful heading has been designed for it. M. M. Ballou, the new proprietor, is resolved to infuse into its columns a spirit of art and general excellence which it has never yet evinced. It will appear on a heavy pearl-surfaced paper, and an entire extra page of illustration will be given weekly. Look out for No. 1 of the new volume. SAMUEL FRENCH, Agent, 121 Nassau st., New York. 1

HERE'S A CHANCE.—Having secured letters patent for propelling vessels, I wish to sell the right of securing the same in foreign countries. I wish to procure means to test it. Address HENRY F. OLDS, New Haven, Ct. 1*

TO ARTESIAN WELL BORERS—Proposals for boring an artesian well, in the Borough of Mechanicsburg, Cumberland Co., Pa., will be received by the subscribers. Full particulars of the cost of boring, tubing, &c., required. Proposals to be sent in immediately. Address Dr. IRA DAY; JEREMIAH LEUSEMAN; L. KAUFFMAN, Committee. Mechanicsburg, Cumberland Co., Pa. 1*

merican and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—MESSRS. MUNN & CO., Publishers and Proprietors of the SCIENTIFIC AMERICAN, continue to prepare specifications and drawings, and attend to procuring patents for new inventions in the United States, Great Britain, France, Belgium, Holland, Austria, Spain, etc., etc. We have constantly employed under our personal supervision a competent board of Scientific Examiners, which enables us to despatch with great facility a very large amount of business. Inventors are reminded that all matter intrusted to our care are strictly confidential, and hence it is unnecessary for them to incur the expense of attending in person. They should first send us a sketch and description of the invention, and we will carefully examine it, state our opinion, and the expense of making an application, if deemed new and worthy of it. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country. Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps toward making an application.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

It is very important that trustworthy and competent agents should be employed in securing patents, as great care is necessary in the preparation of the papers, as well as integrity in taking proper care of the case until the inventor is duly invested with his legal rights. Parties intrusting their business in our hands can rely upon prompt and faithful attention. Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that the largest proportion of patents applied for in the U. S., go through our agency.

The offices of Messrs. Munn & Co.'s American and Foreign Patent Agency are at 128 Fulton Street, New York; London, No. 16 Castle st.; Paris, No. 29 Boulevard St. Martin: Brussels, No. 6 Rue D'Or.

UNITED STATES PATENT OFFICE,
Washington, Nov. 20, 1854.

ON THE PETITION of Franklin Ransom and Uziah Wenman, of the city of New York, praying for the extension of a patent granted to them the 13th day of February, 1841, for an improvement in "the mode of applying water to fire engines so as to render their operation more effective," for seven years from the expiration of said patent, which takes place on the 13th day of February, 1854:

It is ordered that the said petition be heard at the Patent Office on Monday, the 29th of January next, at 12 o'clock M., and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days from the day of hearing. All testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the Office, which will be furnished on application.

The testimony in the case will be closed on the 19th of January; depositions and other papers relied upon as testimony must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Penn.; Scientific American, N. Y.; and New Hampshire Patriot, Concord, N. H., once a week for three successive weeks previous to the 29th of January next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S. Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 14 3

UNITED STATES PATENT OFFICE,
Washington, November 18, 1854.

ON THE PETITION of Squire Whipple, of Albany, New York, praying for the extension of a patent granted to him on the 24th April, 1841, for an improvement in "the construction of iron truss bridges," for seven years from the expiration of said patent, which takes place on the 24th day of Aprtl, 1855—

It is ordered that the said petition be heard at the Patent Office, on Monday, the 26th of March next, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 16th of March: depositions, and other papers relied upon as testimony, must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York, and New Hampshire Patriot, Concord, N. H., once a week for three successive weeks previous to the 26th day of March next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 13 3

NORCROSS ROTARY PLANING MACHINE—The Supreme Court of the U.S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringemet of the Woodworth Patent.

Rights to use N. G. Norcrois's patented machine can be purchased on application to N. G. NORCROSS, 208 Broadway, New York.

Office for sale of rights at 208 Broadway, New York; Boston, 27 State street, and Lowell, Mass. 16 6m

PORTABLE STEAM ENGINES.—S. C. HILLS, No. 12 Platt st., N. Y., offers for sale these Engines, with Boilers, Pumps, Heaters, etc., all complete, and very compact, from 2 to 10 horse power, suitable for printers, carpenters, farmers, planters, &c. A 2½ horse can be seen in store, it occupies a space 5 by 3 feet, weighs 1500 lbs. price $240; other sizes in proportion. 8 e3w

IRVING'S PATENT SAFETY CIRCULATING STEAM BOILER.—TESTIMONIALS—"I certainly would not exchange it for any boiler I have ever seen or used."—W. Burtt, Esq., Kal., Mich.

"It is the most economical boiler and produces more steam of a better quality than any I have ever used."—A. Low, Esq., Franklin Foundry, Albany, N. Y.

"I am well pleased with the principle of this boiler, and believe it to be the best in use."—L. E. Webb, Esq., Guilford, Conn.

"We find evaporation per 1 lb. of coal to be equal to 13·003 lbs. water."—Rep. Messrs. Ehman & Cook, Engineers.

Orders for Boilers promptly filled. Descriptive circulars obtained on application at the Company's office. Rights negotiated for the United States, England, France, and Belgium. W. F. PHELPS, Sec'y Irving Boiler Co. 347 Broadway. 10 6eow*

MATHEMATICAL AND OPTICAL INSTRUMENTS—The undersigned has just opened a new and extensive assortment of the above Instruments, his own selection made in Europe. It should also be kept in mind that he has the exclusive agency for the sale of the justly celebrated Swiss Drawing Instruments. Transits, Levels, and Surveyors Compasses made to order.

C. T. AMSLER,
8 6eow* 211 Chesnut st., Philadelphia, Pa.

CHEAP LIGHT—A. M. MACE, manufacturer of atmospheric or Benzole Gas Machines: size from 2 to 1000 lights. All orders promptly executed corner of Main street and Harrison avenue, Springfield, Mass. 15 3m*

HARRISON'S MILL, PRICE LIST, &c.—These Mills are warranted to give satisfaction.

Size of stone,	20 inch.	30 inch.	3 feet.	4 feet.
Cash price of single geared mills	$100	$200	$300	$400
Do. of double geared do.	$115	$225	$330	$450
Bush. they grind in 10 h	50	150	225	350
Horse power required	1 to 4	6 to 12	12 to 18	50 to 30
Revolutions per minute	500to700	500to800	400to700	400to550
Size of pulleys	9 in.	15 in.	18 in.	24 in.
Width of do.	5 in.	8 in.	10 in.	12 in.
Hight of center of pulley from the floor	9 in.	10 in.	11 in.	14 in.
Weight of Mills	500 lbs.	1400 lbs.	1800 lbs.	300 lbs.
Hight of do. with hopper	2 ft. 9 in.	2 ft. 9 in.	4 feet.	5 feet.

The above sizes, with the latest improvements, to be had of EDWARD HARRISON, sole manufacturer, New Haven, Conn. 12 7*

MACHINE GROUND CIRCULAR SAWS—(Patent applied for.) Mill men would do well to try these saws, are perfectly free from thin or thick places, can be used thinner and with less sett, and run faster than any other hitherto made. All diameters and thicknesses warranted perfectly true. HENSHAW & CLEMSON, 31 Exchange street, Boston. 11 8*

DICTIONARY OF TECHNICAL TERMS—In French, English, and German. A new work presenting all the terms used in science and art. The terms are first given in French, then in English and German. It is the first of three volumes arranged differently, and is a very useful work. For sale at this office, price $1,31

THE FRENCH EXHIBITION—Parties who have applied for space in the French Palace of Industry, and who do not intend to be present at the Exhibition, are recommended by the undersigned to arrange with Messrs. Gardissal & Co., No. 29 Boulevard St. Martin, Paris, who are prepared to put upon Exhibition, attend, and effect sales of articles intrusted to their care. It is a responsible concern. S. H. WALES, State Commissioner, Scientific American Office.

YOU CAN GET THE NEW YORK WEEKLY SUN three months for 25 cts.; six months 50 cts.; one year, 75 cents, 18 months, $1. Or three copies one year, $2; eight copies $5; twenty-five copies $15; and by canvassing for subscribers you may get one of the five cash prizes $50, $20, $15, $10, and $5—for the largest lists sent in before 3rd Feb.—Specimen copies gratis.—Send letters and money (post-paid) to MOSES S. BEACH, Sun Office, New York. 6

COTTON AND WOOLEN MANUFACTURERS' SUPPLIES of every description; also machinery of all kinds; wrought-iron Tackle Blocks of all sizes; Leather Belting superior oak tanned; Bolts, Nuts, and Washers of all sizes on the most reasonable terms. 6 13* SAML. B. LEACH, 51 Broad st.

BUFFALO MACHINERY DEPOT—Terrace St. and 36 Lloyd st., Buffalo; J. W. HOOKER, Proprietor, H. C. Brown, Superintendant, offers for sale Machinists' tools of all kinds: Engine Lathes, Planers, Drills, Chucks, Boring Mills; also machinery of all kinds on hand or furnished to order. 7tf

1854—MICHIGAN CENTRAL R.R. LINE—D. W. WHITING, Freight Agent, and also General Forwarder, having been a practical machinist, is prepared with skill and implements to handle and ship by any line, all kinds of machinery and manufacturers' wares. Mark plainly, care D. W. WHITING, Buffalo, N. Y. 7tf

STAVE AND BARREL MACHINERY—Hutchinson's Patent. This machinery which received the highest award at the Crystal Palace, is now in daily operation there. Staves, heading, &c., prepared by it are worth to the cooper 20 to 40 per cent. more than when finished in any other way. Special attention is invited to the improved Stave Jointer. Apply to C. B. HUTCHINSON & CO., Crystal Palace, or Auburn, N. Y. 13 tf

PATENT DRIERS—Zinc Driers, Graining Colors, Stove Polish, Gold Size, &c., &c., 114 John street, New York. QUARTERMAN & SON, Manufacturers. 1 6m

NEW HAVEN MANUFACTURING COMPANY Machinists' Tools. Iron planers and Engine Lathes of all sizes. Hand Lathes, Gear Cutters, Drills, Bolt Cutters, Chucks, &c., on hand and being built by the quantity, which enables us to sell low. For cuts giving full description and prices, address New Haven Manufacturing Co., New Haven, Conn. 13 tf

HARRISON'S GRAIN MILLS—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt Street, New York. 13 tf

PRICES GREATLY REDUCED—JOHN PARSHLEY, New Haven, Conn., will have 12 of his No. 2 Iron Planers finished by the 1st of January, 1855, to plane 12 feet long, 36 inches wide and 30 inches high, with down and angle feed in the cross-head, they weigh about 8,000 lbs, and are in workmanship and design equal to any planers built in New England. Price 550 dollars cash. Boxing and Shipping extra. For cuts address as above. 13 tf

WIRE ROPE OF IRON AND COPPER—For Mines, Inclined Planes, Hoisting and Steering purposes, Stays or Braces, &c., &c., much safer and far more durable than the best hemp or hyde ropes. Also for Sash Weights, Dumb Waiters, Lightning Conductors, &c. CHARLES W. COPELAND, No. 64 Broadway. 5 14eow

ESTABLISHED IN 1796—Philosophical, Mathematical, and Optical Instruments. Our priced and illustrated Catalogue furnished on application, and sent by mail free of charge. McALLISTER & BROTHER, Opticians, 48 Chesnut st., Philadelphia. 9tf

IRON PLANERS—NEW PATTERN—Now building, and for sale on better terms than any others in the country of same quality. Address New Haven Manufacturing Co., New Haven, Conn. 11 tf

STEAM ENGINES AND BOILERS FOR SALE. One second hand five-horse engine, with tubular boiler. One second-hand two horse portable engine and boiler. THOS. PROSSER & SON, 28 Platt street, 14tf

A. L. ARCHAMBAULT'S Portable Steam Hoisting Engines, for loading and discharging cargoes, raising iron ore from mines, sinking shafts, pile driving, &c. Also arranged for driving Portable Saw Mills. The Engine may be moved by a team on any road. Made only by the inventor, S.-E. Corner of 15th and Hamilton streets, Philadelphia, Pa. 14 4*

A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Messrs. Munn & Co., Scientific American. 16 1y*

VAIL'S CELEBRATED PORTABLE STEAM Engines and Saw Mills, Bogardus' Horsepowers, Smut Machines, Saw and Grist Mill Irons and Gearing, Saw Gummers, Ratchet Drills, &c. Orders for light and heavy forging and castings executed with dispatch. 8 1y* LOGAN VAIL & CO., 9 Gold st., N. Y.

NORTHVILLE MACHINE WORKS—Manufactory of Machinists Tools, consisting of Engine Lathes, Power Planers, Hand Lathes, Engine Lathe for turning chair stuff, all of the most improved patterns and quality of workmanship. Worcester, Northville, Mass., August 9, 1854. TAFT & GLEASON. 50 1y*

MACHINISTS' TOOLS—SHRIVER & BRO., Cumberland, Md., (on B. and O. Railroad, midway between Baltimore and the Ohio River,) manufacturers of Lathes, Iron Planers, Drills and other machinists' tools 50 6m*

© 1854 SCIENTIFIC AMERICAN, INC

Science and Art.

Varnishes.

Having received a number of letters recently, inquiring how to make different kinds of varnishes, we present the following, to save time in replying to each separately.

Different substances are employed for making varnish, the object being to produce a liquid easily applied to the surface of cloth, paper, or metal, which, when dry, will protect it with a fine skin. Gums and resins are the substances employed for making varnish; they are dissolved either in turpentine, alcohol, or oil, in a close stone-ware, glass, or metal vessel, exposed to a low heat, as the case may require, or cold. The alcohol or turpentine dissolves the gum or resin, and holds them in solution, and after the application of the varnish—this mixture being mechanical—the moisture of the liquid evaporates, and the gum adheres to the article to which it is applied.

WHITE SPIRIT VARNISH—Sandarach, 250 parts; mastic in tears, 61; elemi resin, 32; turpentine 64; alcohol, of 85 per cent., 1000 parts; by measure.

The turpentine is to be added after the resins are dissolved. This is a brilliant varnish, but not so hard as to bear polishing.

VARNISH FOR CERTAIN PARTS OF CARRIAGES—Sandarach, 190 parts; pale shellac, 95; rosin, 125; turpentine, 190; alcohol at 85 per cent., 1000 parts; by measure.

VARNISH FOR CABINET-MAKERS—Pale shellac, 750 parts; mastic, 64; alcohol, of 90 per cent., 1000 parts; by measure. The solution is made in the cold, with the aid of frequent stirring. It is always muddy, and is employed without being filtered.

With the same resins and proof spirit a varnish is made for the bookbinders to do over their morocco leather.

For fixing engravings or lithographs upon wood, a varnish called *mordant* is used in France, which differs from others chiefly in containing more Venice turpentine, to make it sticky; it consists of—sandarach, 250 parts; mastic in tears, 64; rosin, 125; Venice turpentine, 250; alcohol, 1000 parts, by measure.

COPAL VARNISH—Hard copal, 300 parts; drying linseed or nut oil, from 125 to 250 parts; oil of turpentine, 500; these three substances are to be put into three separate vessels; the copal is to be fused by a somewhat sudden application of heat; the drying oil is to be heated to a temperature a little under ebullition, and is to be added by small portions at a time to the melted copal.—When this combination is made, and the heat a little abated, the spirits of turpentine, likewise previously heated, is to be introduced by degrees; some of the volatile oil will be dissipated at first; but more being added, the union will take place. Great care must be taken to prevent the turpentine vapor from catching fire, which might occasion serious accidents to the operator. When the varnish is made, and has cooled down to about the 130th degree of Fah., it may be strained through a filter, to separate the impurities and undissolved copal.

Almost all varnish-makers think it indispensable to combine the drying oil with the copal, before adding the oil of turpentine; but in this they are mistaken. Boiling oil of turpentine combines very readily with fused copal; and, in some cases, it would probably be preferable to commence the operation with it, adding it in successive small quantities. Indeed, the whitest copal varnish can only be made in this way; for if the drying oil have been heated to nearly its boiling point, it becomes colored, and darkens the varnish.

This varnish improves in clearness by keeping. Its consistence may be varied by varying the proportions of the ingredients within moderate limits. Good varnish, applied in summer, should become so dry in 24 hours that the dust will not stick to it, nor receive an impression from the fingers. To render it sufficiently dry and hard for polishing, it must be subjected for several days to the heat of a stove.

History of Reaping Machines.—No. 13.

On June 19th, 1835, Sturdivant & Holmes, of Portland, Me., obtained a patent for a rotary reaper, which consisted of four scythes on a vertical shaft, and made to revolve horizontally.

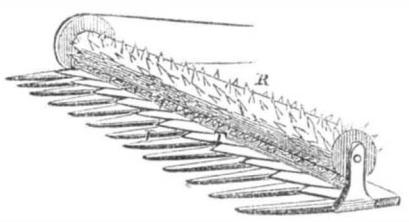
On the 17th of August, the same year, a patent was obtained by John P. Chandler, of Milton, Me., for a rotary reaper, which had four scythes attached to the periphery of a horizontal revolving wheel.

On September 18th, the same year, a patent was also granted to Edward Badlam, Jr., of Chester, Vt., for a rotary reaper which had a number of revolving scythes secured to a vertical shaft. There were small anti-friction wheels secured on the underside of the cutters, and these ran upon the ground. They were kept down by springs, which plan enabled them to accommodate the cutters to unevenness of ground, and to raise them over knolls. The cut grass or grain was received on fingers which conducted it to a rack.

All these four patents were for rotary reapers, and with the exception of the last were alike in nearly every feature.

The next patent granted was for a machine, embracing different objects. It was granted on the same day as that of Mr. Badlam's, to D. Ashmore Peck, of Jefferson Co., Tenn., for cutting grain and grass, and collecting the seed, and its principle is represented in figure 39.

FIG. 39.



This machine was intended to be driven forward like a wheelbarrow, when grass seeds were to be collected; but for collecting the heads of grain, horses are to be employed to drive the apparatus, which, in its general form, resembles a cart. It is mounted upon wheels of such hight as will suit the grain, or grass, the seeds of which are to be collected. The heads, as the machine advances, are to be received between a row of lancet-shaped knives, T, flat on the top, and bevelled to a sharp edge from below. Fingers I, of wood or metal, may also project forward, the better to guide the heads to the knives. Above the knives there is a revolving reel, R, set in motion by bands connected with the running wheels of the carriage; this reel, or open cylinder, carries knives, which come nearly into contact with the row of fixed knives before spoken of, which cut off the heads of the grain or grass.

The claim for this machine was for the lanceolate knives and fingers to hold the grain or clover, to steady it to the action of the revolving knives on the reel. The machine was governed from behind by a rudder, and its object was to collect the heads of grain and grass, leaving the straw upon the ground.

In the month of December (30th) 1835, another patent was granted for a rotary reaping machine to Alex. M. Wilson, of Rhinebeck, N. Y. This machine was to be pushed forward by the horse from behind. It carried a horizontal revolving wheel with scythes in front, and the cutter wheel had rollers under it, so that it could rise over knolls.

In February, next year (1836) a patent was granted to E. Briggs and G. G. Carpenter, of Covington, Ky., for a machine to reap, thrash, and clean grain on the field. Its cutters were revolving scythes, from which the grain was to be carried back to a thrashing cylinder, where it was to be separated from the straw, and cleaned at one continuous operation on the field. We believe that none of the machines described in this chapter arrived at any distinction, and never will. In our next we will illustrate Moore and Hascal's reaper, which created no small amount of trouble in the U. S. Senate last winter.

RETROSPECTIVE.—The following letter on an old American reaping machine throws considerable light on the subject:—

"I see on page 104 some reference to a patent being obtained by Ezra Cope, (my father) and T. Hoops, Jr., on a reaping machine, in 1825.

This was a very efficient machine, but was chiefly used for mowing grass, it would cut an acre in 30 minutes by the watch, better than it possibly could be done by hand. I assisted to build some 25 or 30 of them before I came West, and I much question whether, for the purpose of grass cutting, a better or more simple machine has or ever will be constructed. Two carrying wheels, one pair of gear wheels, which drove the scythe or circular edge, was all the gearing about it. The two horses walked by the side of the cut grass; swath six feet wide, and laid uniform, and much resembling the feather end of a quill. One of them was taken to Gen. Van Rensselaer's farm, Albany, N. Y.

The claim was for an improvement on the Baily machine, which was as cumbersome in its structure as the Cincinnati first fire engines. Yours, &c. N. COPE.

Thomas Hoops, Jr., West Chester P. O., Chester Co., Pa., has been using said machine for upwards of 25 years.

Acorns Kill Bullocks.

R. I. Lamborn, of Chester, Pa., lost fifteen bullocks worth a thousand dollars, as it was thought from eating acorns; the tonic acid of which produced constipation, and a disease resembling dry murrain. Wilted cherry leaves, which contain prussic acid, will produce the same effect.

CURE—Mix a pint of molasses with a pint of melted lard, and pour it down the animal's throat. If the body is much bloated add an enema of soap suds.

MORAL.—This item may cost you a sixpence. It may save you—it would have saved Mr. Lamborn a thousand dollars.—[N. Y. Tribune, Dec. 15th, 1854.

[The above needs some explanation. Is the enema to be added to the molasses and lard? What kind of acid is "tonic acid?" We never heard of it before. What kind of *effect* is meant by the *prussic acid*. Is it the final one—death, or the constipation said to be produced by the tonic acid? If the latter, it is something new in animal chemistry. We are happy to receive light from any source. The cure mentioned above may be very excellent for the disease, but as we cannot understand the one nor the other clearly, from the description presented, we only ask these questions for information.

Ether and Chloroform.

Since the case of Dr. Beale, in Philadelphia, was decided, the dentists in this city have had various meetings, at which every one tried to explain the common ridiculous actions of females under the influence of ether and chloroform. It appears to us from the proceedings of these meetings that almost every one of those who took part in them have been guilty of bad manners in administering ether.

Salt in California.

The editors of the *Alta Californian* have seen samples of coarse salt from the San Quentin salt mines, one hundred and fifty miles below San Diego. The salt is described as natural and bright, and possessing all the requisite properties for curing beef, pork, fish, &c. These, with the works at Los Angelos, will in all probability produce enough for the consumption of this State, which is destined yet to be a heavy exporter of salt fish and an extensive curer of pork.

Consumption of Flour in London.

It is roughly estimated that eight hundred and twenty-seven millions, five hundred and twenty-seven thousand pounds of flour are annually consumed in London.

Winter Colds.

Above all things, says Dr. Culpepper, avoid sudden transitions from heat to cold; it has been the death of thousands. With the thermometer outside about 17° above zero, and stove-dried air in offices and rooms at nearly 100°, these words of warning are worth repetition.

Prizes next Week.

In our next number we shall announce the names of those who have succeeded in gaining our cash prizes.

In a short time the bellows of the great organ in Tremont Temple, Boston, it is stated, will be worked by steam.

The number of steamboats registered in Pittsburgh last year amounted to 61, of an average tunnage of 11,156 tuns. This is pretty good for a city at the head waters of Ohio.

LITERARY NOTICES.

THE SOUTHERN STATESMAN—This is the title of a neat weekly paper, published at Prattville, Ala.,—Luckett & Ormsby, Editors and Proprietors—the first number of which is before us. It is intended to be a useful and entertaining family paper, devoted to every subject relating to the interest of Alabama and the South generally. It is edited with evident ability, and from what we know of Mr. Ormsby, the people of Alabama may rely upon the *Statesman* doing honor to their State.

HOUSEHOLD WORDS—A journal conducted by Charles Dickens, a somewhat celebrated English writer. The January number is issued by a new publisher, J. A. Dix, this city, who has purchased the interest of Mr. McElrath in the work. It is always lively and interesting, and is one of those magazines which we always read with profit and pleasure.

THE NATIONAL MAGAZINE—Carlton & Phillips—The January number contains a portrait of H. R. Schoolcraft, several illustrations from the Pilgrim's Progress, Relics of the Puritans, and a Trip from St. Petersburgh to Constantinople. The literary texture of the magazine is as usual very fine, and attests to the well-earned ability of Mr. Stevens, its Editor.

Dewitt & Davenport, of this city, have issued a very neat and well-prepared volume entitled "Humanity in the City," being a series of discourses preached by the Rev. E. H. Chapin, D. D., of this city, who is one of the most eloquent men of the times. They are not sectarian, but "humanitarian," and will be widely read by all classes. We are much pleased with his noble tribute to the inventor: he shows a proper appreciation of this useful class of our community. The first discourse in the book is a very common-place affair, but its lack of point is fully made up by those that succeed it. New York City presents a field for missionary labor scarcely surpassed by heathendom in its darkest aspects.

DAILY JOURNALS FOR 1855—Francis & Loutrel, No. 77 Maiden Lane, have now ready for sale their usual varieties of journals for 1855. They are extremely convenint for recording our daily transactions. The same firm also manufacture account books, etc.

MECHANICS

Inventors, and Manufacturers

The Tenth Volume of the SCIENTIFIC AMERICAN commenced on the 16th of September. It is an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanic and Chemic Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Millwork, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

Its general contents embrace notices of the LATEST AND BEST SCIENTIFIC, MECHANICAL, CHEMICAL, AND AGRICULTURAL DISCOVERIES,—with Editorial comments explaining their application notices of NEW PROCESSES in all branches of Manufactures; PRACTICAL HINTS on Machinery; information as to STEAM, and all processes to which it is applicable; also Mining, Millwrighting, Dyeing, and all arts involving CHEMICAL SCIENCE; Engineering, Architecture; comprehensive SCIENTIFIC MEMORANDA: Proceedings of Scientific Bodies; Accounts of Exhibitions,—together with news and information upon THOUSANDS OF OTHER SUBJECTS.

Reports of U. S. PATENTS granted are also published every week, including OFFICIAL COPIES of all the PATENT CLAIMS; these Claims are published in the Scientific American IN ADVANCE OF ALL OTHER PAPERS.

The CONTRIBUTORS to the Scientific American are among the MOST EMINENT scientific and practical men of the times. The Editorial Department is universally acknowledged to be conducted with GREAT ABILITY, and to be distinguished, not only for the excellence and truthfulness of its discussions, but for the fearlessness with which error is combated and false theories are exploded.

Mechanics, Inventors, Engineers, Chemists, Manufacturers, Agriculturists, and PEOPLE IN EVERY PROFESSION IN LIFE, will find the SCIENTIFIC AMERICAN to be of great value in their respective callings. Its counsels and suggestions will save them HUNDREDS OF DOLLARS annually, besides affording them a continual source of knowledge, the experience of which is beyond pecuniary estimate.

The SCIENTIFIC AMERICAN is published once a week; every number contains eight large quarto pages, forming annually a complete and splendid volume, illustrated with SEVERAL HUNDRED ORIGINAL ENGRAVINGS.

TERMS! TERMS!! TERMS!!!

One Copy, for One Year	$2
" Six Months	$1
Five copies, for Six Months	$4
Ten Copies for Six Months,	$8
Ten Copies, for Twelve Months	$15
Fifteen Copies for Twelve Months	$22
Twenty Copies for Twelve Months	$28

Southern, Western, and Canada Money taken at par for Subscriptions, or Post Office Stamps taken at their par value. Letters should be directed (post-paid) to

MUNN & CO.
128 Fulton street, New York.

☞ For LIST OF PRIZES see Editorial page.

© 1854 SCIENTIFIC AMERICAN, INC